RF BASED WIRELESS HORN SYSTEM FOR VEHICLES AND DEAF PEOPLE INTIMATION WITH NOISE CONTROLLER

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ABSTRACT:

As sound pollution Leads Increases blood pressure, Has negative cardiovascular effects such as changing the way the heart beats , Increases breathing rate ,Sleep disturbance, Hypertension,Stress, Heart attack, Artery diseases, Memory loss ,Disturbs digestion ,Can cause an upset stomach or ulcer , Can negatively impact a developing fetus, perhaps contributing to premature birth and Sound Horns From Vehicles are one of the major reason for noise pollution. It is a horn with wireless signal transmission. Yes a wireless horn can reduce this noise pollution from vehicle horns. Not only prevent pollution but also control accidents and make the atmosphere pleasant .

When the horn switch is pressed a Radio frequency signal is produced from the embedded system and is capable of travelling around a distance 40- 60 meters. Every vehicles should contain the embedded transmitter receiver kit ,so that the signal received by the nearby vehicles will produce a beep sound using a buzzer ,where the sound is audible to the driver only and not disturbing the passengers, pedestrians , trespassers or even any activities of the nature. The kit can also be connected to an ultrasonic reverse parking sensor which is now common in all vehicles. when the horn signal is received in a vehicle the sensor will operates for 3 seconds by getting a relay signal from the receiver and it can sense any vehicle behind it with in distance of 14 feet. So the driver can get the exact distance of any vehicle behind it, during the horn is pressed.

INTRODUCTION:

In this system we are going to control the noise pollution is occurred by the horn of the vehicles. For that we are developing a wireless horn system using RF transmitter and Receiver module.The RF module, as the name suggests, operates at Radio Frequency. The corresponding frequency range varies between 30 kHz & 300 GHz. In this RF system, the digital data is represented as variations in the amplitude of carrier wave. This kind of modulation is known amplitude shift keying modulation. This RF module comprises of an RF Transmitter and an RF Receiver.

The transmitter/receiver (Tx/Rx) pair operates at a frequency of 434 MHz. An RF transmitter receives serial data and transmits it wirelessly through RF through its antenna connected at pin4. The transmission occurs at the rate of 1Kbps - 10Kbps.The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter. The RF module is often used alongwith a pair of encoder/decoder.

The encoder is used for encoding parallel data for transmission feed while reception is decoded by a decoder. HT12E-HT12D, HT640-HT648, etc. are some commonly used encoder/decoder pair Ics.

EXISTING SYSTEM:

With the development of high transportations and urban road construction, the noise pollution generated by traffic is a significant and growing problem. Sound barrier, an effective and comparatively inexpensive measure of reducing noise levels, will be developed to some degree. It will do much benefit to the living quality of the residents along the road if we can take good advantages of its technical property. According to sound properties and mechanical properties, the noise effect of the 14th dormitory is described in this paper. The target value and equivalent continuous A sound level is counted, comparing with the noise standard.

In recent years, despite contribution rate ofthe traffic noise to the urban noise present the downward trend, but it is still a major source ofurban environmental noise, and the influence is the most extensive, and pollution is the most serious, and occupy about 70 percent of urban noise, impact 30~ 80 percent area of the whole city. For example, the building, education authorities and hospital on both sides of the street, have become the main sources hospital now have been polluted by the traffic noise.

Noise is the sound that people don't need, it is a natural phenomenon, also may be formed by human activities. Noise can be the disorderly broadband voice, or be harmonious happy rhythms, and the harm of the noise is in many aspects . Longterm exposure to high noise environment can harm the health of human body, and damage hearing, affect Sleep, induce illnesses, interfere conversation.

DISADVANTAGES:

- In existing system , this application is done based on Embedded with the help of GSM.
- Identifying is little bit difficult in this system.
- Efficiency level is low.

PROPOSED SYSTEM

In this system we are going to control the noise pollution is occurred by the horn of the vehicles. For that we are developing a wireless horn system using RF transmitter and Receiver module.The RF module, as the name suggests, operates at Radio Frequency. The corresponding frequency range varies between 30 kHz & 300 GHz. In this RF system, the digital data is represented as variations in the amplitude of carrier wave. This kind of modulation is known amplitude shift keying modulation. This RF module comprises of an RF Transmitter and an RF Receiver.

The transmitter/receiver (Tx/Rx) pair operates at a frequency of 434 MHz. An RF transmitter receives serial data and transmits it wirelessly through RF through its antenna connected at pin4. The transmission occurs at the rate of 1Kbps - 10Kbps.The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter. The RF module is often used alongwith a pair of encoder/decoder.The encoder is used for encoding parallel data for transmission feed while reception is decoded by a decoder. HT12E-HT12D, HT640-HT648, etc. are some commonly used encoder/decoder pair Ics.

In this system the controlling is done by using Atmega328p. The Controller module is placed in the remote area and the system is interfaced with the required application. In order to control the system automatically. We are going to monitoring level of the sound of the horn and switch automatically using Atmega328p.

BLOCK DIAGRAM:
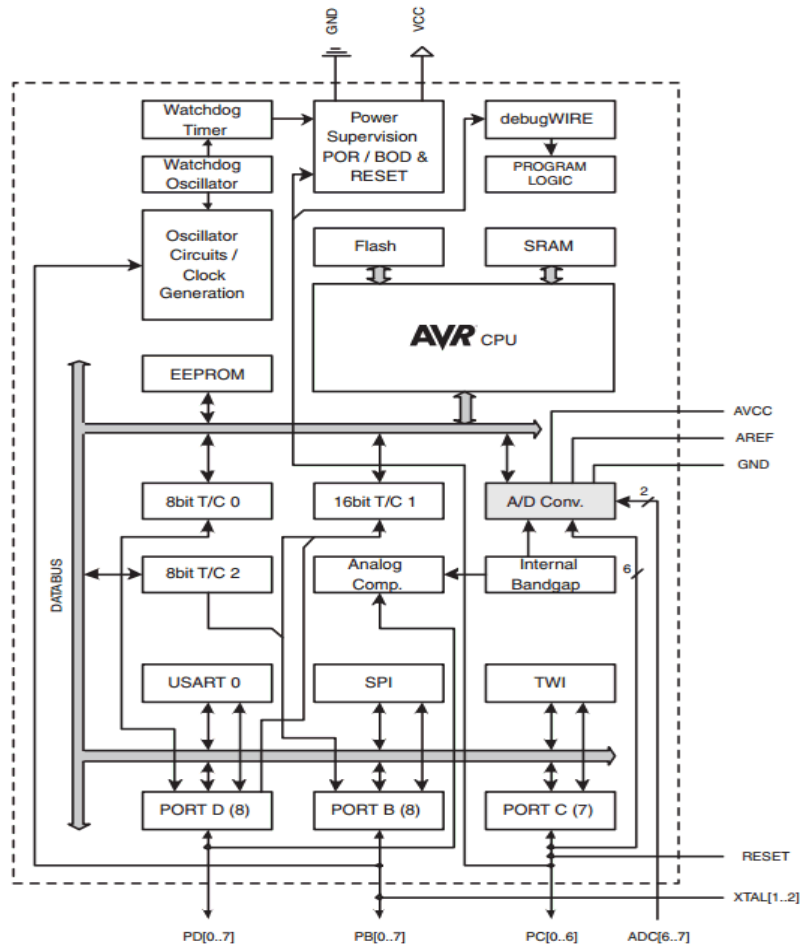
MICROCONTROLLER:

Introduction Of atmega328p

The Atmel® picoPower® ATmega328/P is a low-power CMOS 8-bit microcontroller based on the AVR® enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328/P achieves throughputs close to 1MIPS per MHz. This empowers system designer to optimize the device for power consumption versus processing speed.

The device is manufactured using Atmel's high density non-volatile memory technology. The On-chip ISP Flash allows the program memory to be reprogrammed In-System through an SPI serial interface, by a conventional nonvolatile memory programmer, or by an On-chip Boot program running on the AVR core. The Boot program can use any interface to download the application program in the Application Flash memory. Software in the Boot Flash section will continue to run while the Application Flash section is updated, providing true Read-While-Write operation. By combining an 8-bit RISC CPU with In-System Self-Programmable Flash on a monolithic chip, the Atmel ATmega328/P is a powerful microcontroller that provides a highly flexible and cost effective solution to many embedded control applications.

FEATURES:

High Performance, Low Power Atmel®AVR® 8-Bit Microcontroller Family

• Advanced RISC Architecture

    – 131 Powerful Instructions

    – Most Single Clock Cycle Execution

    – 32 x 8 General Purpose Working Registers

    – Fully Static Operation

    – Up to 20 MIPS Throughput at 20MHz

    – On-chip 2-cycle Multiplier

Operating Voltage:

– 1.8 - 5.5V

• Temperature Range

    – -40°C to 105°C

ARCHITECTURE OF ATMEGA328p:

The ATmega48PA/88PA/168PA/328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle.ATmega48PA/88PA/168PA/328P achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

The AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers.

The ATmega48PA/88PA/168PA/328P provides the following features: 4/8/16/32K bytes of InSystem Programmable Flash with Read-While-Write capabilities, 256/512/512/1K bytes EEPROM, 512/1K/1K/2K bytes SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible Timer/Counters with compare modes, internal and external interrupts, a serial programmable USART, a byte-oriented 2-wire Serial Interface, an SPI serial port, a 6-channel 10-bit ADC (8 channels in TQFP and QFN/MLF packages), a programmable Watchdog Timer with internal Oscillator, and five software selectable power saving modes. The Idle mode stops the CPU while allowing the SRAM, Timer/Counters, USART, 2-wire Serial Interface, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next interrupt or hardware reset.

ADVANTAGES:

➤ Easy to learn

➤ Wide array of sensors

➤ Many third-party libraries

➤ A large amount of projects and resources that exist for free (online)

LCD DISPLAYS:

There are many display devices used by the hobbyists. LCD displays are one of the most sophisticated display devices used by them. Once you learn how to interface it, it will be the easiest and very reliable output device used by you! More, for micro controller based project, not every time any debugger can be used. So LCD

displays can be used to test the outputs. Obviously, for last possibility, you need to know how to use this stuff pretty well.

Most of the LCD Displays available in the market are 16X2 (That means, the LCD displays are capable of displaying 2 lines each having 16 Characters a), 20X4 LCD Displays (4 lines, 20 characters). It has 14 pins. It uses 8lines for parallel data plus 3 control signals, 2 connections to power, one more for contrast adjustment and two connections for LED back light.

DATA/SIGNALS/EXECUTION OF LCD:

LCD accepts two types of signals, one is data, and another is control. These signals are recognized by the LCD module from status of the RS pin. Now data can be read also from the LCD display, by pulling the R/W pin high. As soon as the E pin is pulsed, LCD display reads data at the falling edge of the pulse and executes it, same for the case of transmission.

LCD display takes a time of 39-43µS to place a character or execute a command. Except for clearing display and to seek cursor to home position it takes 1.53ms to 1.64ms. Any attempt to send any data before this interval may lead to failure to read data or execution of the current data in some devices. Some devices compensate the speed by storing the incoming data to some temporary registers.
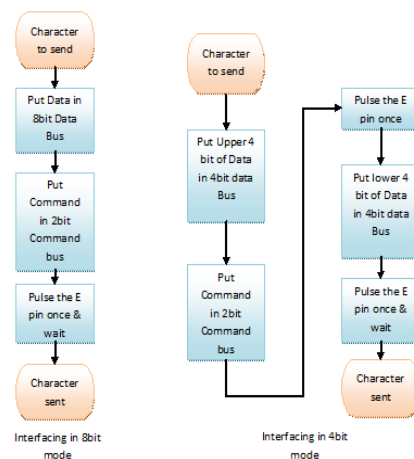
LCD DISPLAY INTERFACING FLOWCHAT:

Fig: Flow chart of interfacing LCD display

RF TRANSMITTER AND RECEIVER:

What is an RF Module?

An RF Module is a small electronic circuit which is used to receive, transmit or transreceive radio waves on one of a number of carrier frequencies. RF Modules are often used in consumer applications including wireless alarm systems, garage door openers, industrial remote controls, wireless home automation systems and smart sensor applications

RF Modules & Solutions from Future Electronics

Future Electronics carries a wide range of RF Modules & Solutions from the best quality manufacturers. Once you decide if you need a 802.11 / WLAN Module, 802.15.4 / Zigbee Module, Bluetooth Module, Bluetooth Accessories, GPS Module, Proprietary RF Module, RFID Module or UHF Module, you can choose from their technical attributes and your search results will be narrowed in order to match your specific RF module

application needs. You will therefore be able to find the right RF module for your Bluetooth device, blue tooth serial module or other types of RF modules.

Applications for RF Modules & Solutions:

Typical applications for RF modules include vehicle monitoring, remote controls, telemetry, small-range wireless networks, area paging, industrial data acquisition systems, wireless meter reading, access control systems, wireless home security systems, reading of radio tags, RF contact-less smart cards, wireless data terminals, wireless fire protection systems, robot remote control, wireless data transmissions, digital video/audio transmission, biological signal acquisition, hydrological and meteorological monitoring, digital home automation (ex: remote light switches)

I2C Bus Protocol:

The I2C bus was developed by Philips Semiconductors. Its original purpose is providing an easy way to connect CPU to peripherals chips. Peripheral devices in embedded systems are often connected to the microcontroller as memory mapped devices. I2C requires only two wires for connecting all the peripherals to the microcontroller. These active wires, called SDA and SCL, are both bidirectional. SDA line is a serial data line and SCA line is a serial clock line.Connection of Single Master and multiple slave devices using SDA and SCA lines

Buzzer:

A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signalling device. A piezo electric buzzer can be driven by an oscillating electronic circuit or other audio signal source. A click, beep or ring can indicate that a button has been pressed.

A buzzer is a small yet efficient component to add sound features to our project/system. It is very small and compact 2-pin structure hence can be easily used on breadboard even on PCBs which makes this a widely used. This buzzer can be used by simply powering it using a DC power supply ranging from 4V to 9V. A simple 9V battery can also be used, but it is recommended to use a regulated +5V or +6V DC supply.The buzzer is normally associated with a switching circuit to turn ON or turn OFF the buzzer at required time and require interval.

Buzzers from Future Electronics

Future Electronics has a complete selection of buzzers from several manufacturers that can be used as an electromagnetic buzzer, piezo buzzer, electro-acoustic transducer, piezo electric transducers or magnetic buzzer for any electric circuit applications. Simply choose from the buzzer technical attributes below and your search results will quickly be narrowed in order to match your specific buzzer application needs.If you have a preferred brand, we deal with CUI Inc, Intervox/ICC, Mallory and Murata, among others. You can easily refine your buzzer product search results by clicking your preferred buzzer brand below from our list of manufacturers.

Applications for Buzzers:

Typical uses of buzzers include:

- Alarm devices
- Timers
- Confirmation of user input (ex: mouse click or keystroke)
- Electronic metronomes

- Annunciator panels

- Game shows

- Sporting events

Power Supply

The present chapter introduces the operation of power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage. The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.

Working Principle:

Transformer

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op–amp.The advantages of using precision rectifier are it will give peak voltage output as DC, rest of the circuits will give only RMS output.

Bridge rectifier

When four diodes are connected as shown in figure, the circuit is called as bridge rectifier. The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners. Let us assume that the transformer is working properly and there is a positive potential, at point A and a negative potential at point B. the positive potential at point A will forward bias D3 and reverse bias D4.The negative potential at point B will forward bias D1 and reverse D2. At this time D3 and D1 are forward biased and will allow current flow to pass through them; D4 and D2 are reverse biased and will block current flow.

IC voltage regulators
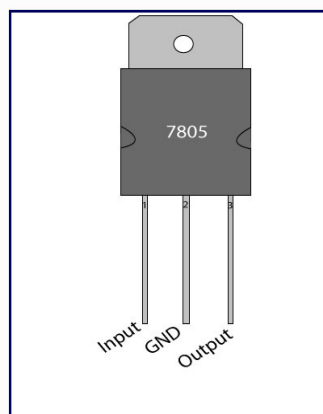
Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. Although the internal construction of the IC is somewhat different from that described for discrete voltage regulator circuits, the external operation is much the same. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustably set voltage.

RELAY:

A relay is an electrical switch that opens and closes under control of another electrical circuit. In the original form, the switch is operated by an electromagnet to open or close one or many sets of contacts. It was invented by Joseph Henry in 1835. Because a relay is able to control an output circuit of higher power than the input circuit, it can be considered, in a broad sense, to be a form of an electrical amplifier.

SOFTWARE REQUIREMENT

EMBEDDED C

➢ Embedded C is a set of language extensions for the C programming language by the C standards committee to address commonality issues that exist between C extensions for different embedded systems. Historically embedded C programming requires non-standard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory banks and basic I/O operations.

Advantages of Embedded C

➢ C compilers are available for almost all embedded devices in use today and there is a large pool of experienced C programmers.

➢ It is fairly efficient.

➢ It supports access to I/O and provides ease of management of large embedded projects.

PROTEUS

The proposed system that is going to be described in this phase is done using the Proteus model. In order to get the desired output, the simulation circuit has been designed in Proteus software by using the respective components that is present in the Proteus. This simulation circuit will be described in detail below.

Distributed Application Features

AQuA applications using the current implementation of Proteus may exhibit the following properties:

➢ Any CORBA object in the application may act as a client and as a server.
➢ Any CORBA object in the application may communicate with multiple applications.

Protocol Coordinator

The protocol coordinator's CORBA interface consists of the following methods:

view change – This method is called by the AQuA application gateways to report Maestro/Ensemble view changes. Given view change information, the protocol coordinator determines whether the view change is the result of a crash failure, a configuration change requested by Proteus, or both.

register – This method is called by an object factory to register itself. After setting up the internal data structures to handle a new host in the system, the dependability manager returns a reply to inform the factory that it has registered itself successfully.

start reply – This method is called by an object factory to report the status of a request made to start an application.

kill reply – This method is called by an object factory to report the status of a request made to kill an application.

load reply – This method is called by an object factory to report the load of its host. This may be the result of a request for the load from the dependability manager or be part of the periodic update of the load performed by the object factory.

The Proteus Environment

Proteus ARDUINO Bundle is the complete solution for developing, testing and virtually prototyping your embedded system designs based around the Microchip Technologies ^{TM} series of microcontroller. This software allows you to perform schematic capture and to simulate the circuits you design. A demonstration on the use of PROTEUS will be given to you on this lab session, after that; you are encouraged to learn to use the software interactively. Type ' ARDUINO TCP ' in the Key words field and double click on the result to place the ATMEGA328p in to the Object Selector. Do the same for the LEDs, Buttons, Crystal oscillator, capacitors, 7 SEG-COM- Cathode, Resistors. Once you have selected all components into the design close the Library Browser and left click once on any component in the Object Selector

Attaching the HEX File

➢ It is necessary to specify which file the processor is to run. In our example this will be filename.hex (the hex file produced from MPASM subsequent to assembling filename.asm).

➢ To attach this file to the processor, right click on the schematic part for the ATMEGA328p and then left click on the part. This will bring up the Edit Component dialogue form which contains a field for Program File. If it is not already specified as filename.hex either enter the path to the file manually or browse to the location of the file via the button to the field

Debugging the Program (Simulating the Circuit)

In order to simulate the circuit point the mouse over the Play Button on the animation panel at the bottom right of the screen see Figure 10 and click left. The status bar should appear with the time that the animation has been active.

CONCLUTION:

Atlast we decide to reduce the noise pollution in traffic because of the adverse effects produced by the over usage of horn sound that turns into noise, by the use of RF transmitter and receiver. It can also be adapted by the government for the future use. It can be a less cost , user friendly and efficient technology. An additional advantage which includes that the peoples who are deaf can also use this technique , by the use of smart wearable devices.

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