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A Non-Invasive Hearing Aid Using Gsm Module

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Abstract: According to survey in India the legally deaf percentage is about 6.3%. The person may lose their hearing sense their by birth or due to some accidents. In order to assist their hearing loss the device was invented that is hearing aid. This device works such that it will get the input in the mic amplifier the signal and gives the output to the user. In the existing system only outer drum problem is analyzed and system was designed to overcome those and it also painful due to surgery. So in order to solve the inner drum problem a system is designed at low cost, efficient manner and controlling ability is done through GSM. This hearing device is designed to use the natural amplification of your ear. Any sound in that that coming from GSM Modem. This hearing device will be fitted to the upper left or right teeth in the back of your mouth. This doesn't require any of your teeth to be altered, and the device can be inserted and removed easily. This hearing device is a flat piece (in Real-Time Product) that contains a sealed rechargeable battery, and electronics and wireless capabilities that can pick up sound transmissions from the behind-the-ear microphone. This hearing device is a flat piece (in Real-Time Product) that contains a sealed rechargeable battery, and electronics and wireless capabilities that can pick up sound transmissions from the behind-the-ear microphone. Unlike implantable bone conduction hearing aids, SoundBite requires no surgery.

Keywords: Hearing loss, hearing aid, Embedded system, GSM, MPLAB

1. INTRODUCTION

1.1 HEARING AID

Hearing Aid is the device used as assist device for hearing loss persons. There are many evolutions are made in this hearing aid. Similarly they are many types of hearing aid are available in the market. The person finds some difficulty in controlling the device. Analog

type device are also available in which the analog signals are mixed along with noise. So, digital hearing aid is designed for betterment and higher efficiency. Later the controlling parts are evolved from wired to wireless. The information can be transmitted using the Bluetooth also using GSM. It is for high efficiency, lower power consumption and noise reduction.

1.2 EMBEDDED SYSTEM DESIGN CYCLE

This in situ we want to debate the role of simulation computer code, time period systems and information acquisition in dynamic take a look at applications. Ancient testing is brought up as "static" testing wherever practicality of parts is tested by providing noted inputs and measurement outputs. Nowadays there's additional pressure to urge merchandise to plug quicker and cut back style cycle times. This has light-emitting diode to a necessity for "dynamic" testing wherever parts area unit tested whereas in use with the whole system – either real or simulated. Attributable to price and safety considerations, simulating the remainder of the system with time period hardware is most popular to testing parts within the actual real system. The diagram shown on this slide is that the "V Diagram" that's usually accustomed describe the event cycle. Originally developed to encapsulate the look method of computer code applications, totally different many various many alternative versions of this diagram will be found to explain different product style cycles. Here we've shown one example of such a diagram representing the look cycle of embedded management applications common to automotive, region and defense applications.

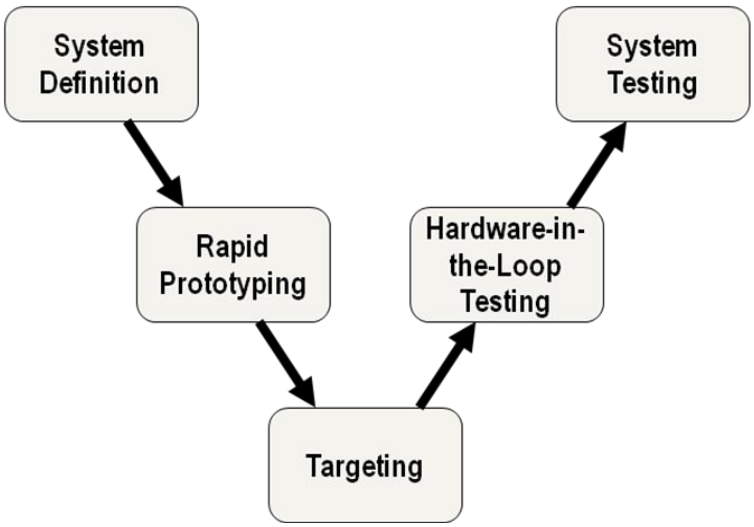


Figure 1.2 "V Diagram"

During this diagram the overall progression in time of the event stages is shown from left to right. Note but that this is usually often associate degree unvaried method and also the actual development won't proceed linearly through these steps. The goal of fast development is to form this cycle as economical as potential by minimizing the iterations needed for a style. If the coordinate axis of the diagram is believed of as time, the goal is to slim the "V" the maximum amount as potential and thereby cut back development time.

The coordinate axis of this diagram will be thought of because the level at that the system parts area unit thought of timely within the development, the

wants of the system should be thought of. Because the system is split into sub-systems and parts, the method becomes terribly low-level all the way down to the purpose of loading code onto individual processors. Later parts area unit integrated and tested along till such time that the whole system will enter final production testing. Thus the highest of the diagram represents the high-level system read and also the bottom of the diagram represents a really low-level read.

Notes:

- V diagram describes immeasurable applications—derived from computer code development.
- Reason for form, each section of style needs a complimentary take a look at section. High-level to low-level read of application. This may be a simplified version.
- Loop Back/Iterative method, coordinate axis is time (sum up).

2. SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

Many hearing devices were found for outer drum drawback solely. Inner drum Problem is sometimes a permanent condition that impairs one's ability to inform the direction a sound is coming back from. It may also be liable for issue understanding speech or conversations on the deaf ear facet, notably during a blatant atmosphere. Some medical treatments have been planned however that wants surgery. Thanks to that surgery it's going to results in further issues.

2.2 DISADVANTAGES

- With the prevailing system inner drum failure will be cured by surgery, that may be a painful method.
- Several hearing devices were found for outer drum drawback solely. For the diabetic patients its not best to try to to surgery and also the inner drum failure can not be cured.

2.3 PROPOSED SYSTEM

This hearing device is intended to use the natural amplification of your ear. Any sound in this coming back from GSM electronic equipment. It uses a digital processor (PIC16F877A) to transmit to the sound to an electricity mechanism that wants little power to come up with the vibrations that travel through bone, that successively sends those sound vibrations into your tube through your teeth. This way, the sound is transported from your impaired ear on to your hearing ear. These hearing devices are going to be fitted to the higher left or right teeth within the back of your mouth. This doesn't need any of your teeth to be altered, and also the device will be inserted and removed simply. This hearing device may be a flat piece (in time period Product) that contains a sealed reversible battery, and physical science and wireless capabilities which will acquire sound transmissions from the behind-the-ear electro-acoustic transducer.

2.4 ADVANTAGES

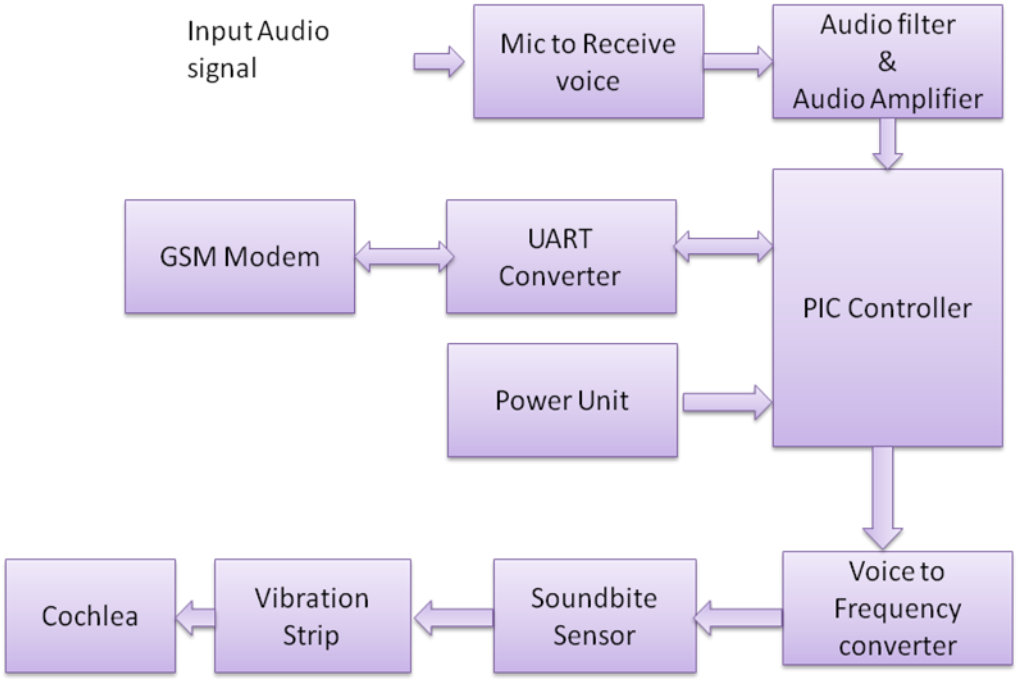
- Unlike implantable bone physical phenomenon hearing aids, Sound Bite needs no surgery.
- Custom created for every person, Sound Bite is straightforward, removable, and all non-invasive.

- This doesn't need any of your teeth to be altered, and also the device will be inserted and removed simply.

3. BLOCK DIAGRAM OF THE PROPOSED SYSTEM

This hearing device is designed to use the natural amplification of your ear.

Figure 3.1 Block diagram of the proposed system



Any sound in that that coming from GSM Modem. This hearing device will be fitted to the upper left or right teeth in the back of your mouth. This doesn't require any of your teeth to be altered, and the device can be inserted and removed easily. This hearing device is a flat piece(in Real-Time Product) that contains a sealed rechargeable battery, and electronics and wireless capabilities that can pick up sound transmissions from the behind-the-ear microphone.

3.1 HARDWARE MODULE DESCRIPTION

1. MIC TO RECEIVE VOICE SIGNAL

In this block we are going to use a mic that is employed to convert the voice signal into electrical signal.

2. AUDIO FILTER AND AUDIO AMPLIFIER

Audio filter is employed to get rid of the noise signal within the received voice signal.
Audio amp is employed to spice up up the received voice signal once removing the noise.

3. PIC CONTROLLER

We have a tendency to square measure exploitation PIC16F877A microcontroller that is that the central process unit that controls all the operation. This is often an 8-bit figure

with forty pins and also the in operation voltage is two to five.5v. The memory kind employed in this PIC is non-volatile storage. This PIC consists of 8bit design. This figure consists of intrinsical UART module.

4. UART MODULE

UART is understood as Universal Asynchronous Receiver Transmitter this is often the fundamental interface that is employed for reliable communication between the controllers and computer. This controller is employed to show a text in computer from the PIC.

5. GSM MODEM

GSM electronic equipment could be a specialized form of electronic equipment that accepts a sim card and operates sort of a movable.

6. POWER UNIT:

The facility unit consists of a electrical device that is associate device thattransfers voltage between 2 or additional circuit.

7. GSM MODEM

GSM electronic equipment could be a specialized form of electronic equipment that accepts a sim card and operates sort of a movable.

8. VOICE TO FREQUENCY CONVERTER

A frequency device is associate device that converts ac current of 1 frequency to ac current of another frequency.

9. VIBRATION STRIP

The Vibration Strip could be a non cylindrical rubber strip. This is often a non-reinforced rubber bearing system with advanced wavy style.

10. COCHLEA

The tube could be a portion of the sense organ that appears sort of a snail shell. This receives the sound within the type of vibrations then converts these vibrations into nerve impulses that square measure concerned to the brain to be understood.

3.2 SOFTWARE DESCRIPTION

MPLAB Integrated Development setting (IDE) could be a free, integrated toolset for the event of embedded applications using Microchip's PIC small and dsPIC microcontrollers. MPLAB IDE runs as a 32-bit application on MS Windows, is simple to use and includes a number of free computer code parts for quick application development and super-charged debugging. MPLAB IDE additionally is one, unified graphical computer program for added semiconductor unit and third party computer code and hardware development tools. select MPLAB C18, the extremely optimized compiler for the PIC18 series microcontrollers, or attempt the latest Microchip's language tools compiler, MPLAB C30, targeted at the high performance PIC24 and dsPIC digital signal controllers. Or, use one among the numerous merchandise from third party language tools vendors.

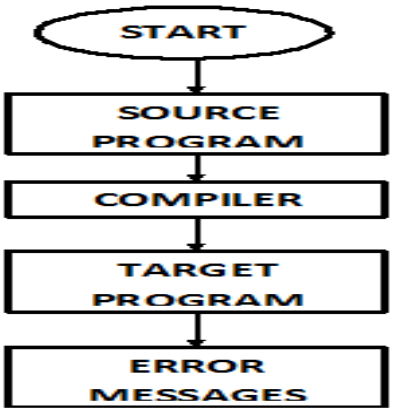


Figure 3.2.1 Flow diagram of the compiler

They integrate into MPLAB IDE to perform transparently from the MPLAB project manager, editor and compiler.HI-TECH computer code makes weapons-grade computer code development tools and C compilers that facilitate computer code developers write compact, economical embedded processor code. advanced PICC could be a superior C compiler for the semiconductor unit PIC small 10/12/14/16/17 series of microcontrollers. advanced PICC is associate weapons-grade ANSI C compiler - not a set implementation like another PIC compilers.

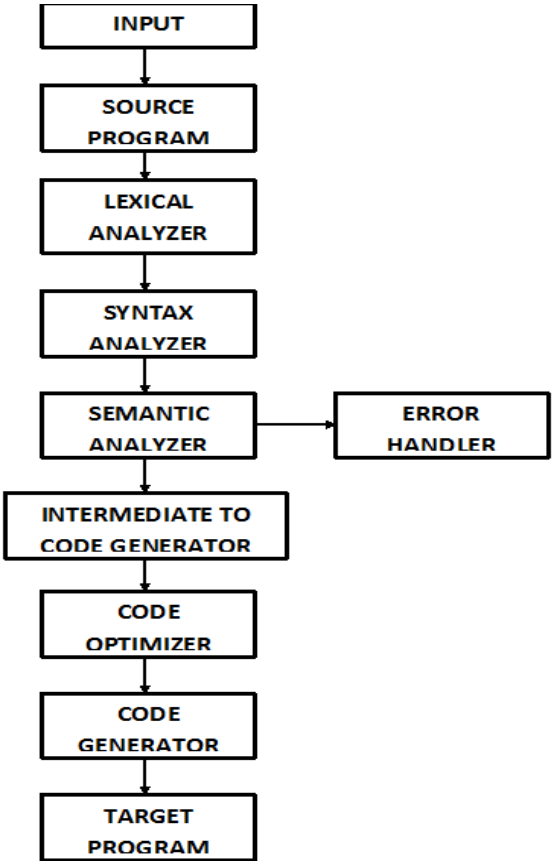


Figure 3.2.2 Flow diagram of the system analyzer

4. CONCLUSION

During this project we have a tendency to square measure implementing a GSM based mostly voice processing device. Exploitation this device someone WHO has inner drum failure will be cured while not undergoing any surgery. This device is extremely useful for the one who has inner drum failure, wherever they will hear music, record and playback.
This device consists of GSM electronic equipment that is a mobile wherever the deaf folks will communicate.

1. FUTURE ENHANCEMENT

- The planned device willbe created compact wherever each the deaf folks with inner and outer drum failure will use a similar device.
- This will be enforced in mobile devices wherever the deaf folks can even use the mobile devices with none difficulties.

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