

## CHALLENGER'S MEDIA

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### ABSTRACT

*In the present scenario, the deaf-dumb and blind people focuses a lot of problems in their day to day life. Communication is one of the major problem faced by them. To solve this problem a special embedded kit was developed. Here the hand sign shown by the deaf -dumb will be converted into voice, Blind can hear the converted voice through the speaker, and reply from the blind will be given by using the special keypad which will display the message typed by the blind using the LCD display which can be viewed by deaf-dumb. So in this way deaf-dumb can convey their message to blind through the speaker and blind can convey their message to deaf-dumb through the LCD display. Now both way communication is possible using this technique.*

**KEYWORDS:** *embedded system, flex sensor, speech synthesizer, sign language, communication.*

### I. INTRODUCTION

Communication is the activity of conveying information through the exchange of thoughts, messages, or information, as by speech, visuals, signals, writing, or behaviour. It is the meaningful exchange of information between two or more living creatures.

One definition of communication is “any act by which one person gives to or receives from another person information about that person's needs, desires, perceptions, knowledge, or affective states. Communication may be intentional or unintentional, may involve conventional or unconventional signals, may take linguistic or non-linguistic forms, and may occur through spoken or other modes.” Challenger's media is the one providing two way communication between deaf & dumb and blind people. This paper organized as follows, section IV contains the explanation of the components, section V explains working of the kit and section VII has future work.

### II. EXISTING SYSTEM

There is no existing system for communication between blind and deaf - dumb. Only the blind can understand and communicate with other people and respond to it through speech. But deaf - dumb have their own sign language which helps them to communicate with their society. But when a need arises where deaf is in a situation to communicate with the blind , then there is no possibility for communication between them.

### III. PROPOSED SYSTEM

This paper proposes a system which aims at overcoming this problem. The proposed idea is the one to satisfy the needs of both the community. When a blind wants to communicate with the deaf -dumb

they make use of the keypad. The input of which is fed to the microcontroller and then accordingly the output is the message from the blind is displayed on the LCD which can be read by the deaf. When a deaf wants to communicate they make use of the sign language which is fed to a microcontroller and the output is given through the speaker which has the recorded voice stored in voice recorder based on the sign used by deaf-dumb which is heard by blind.

#### IV. BLOCK DIAGRAM

The device developed to implement this idea contains flex sensors, PIC microcontroller, LCD display, Keypad, Voice recorder and a speaker. Fig.1 shows the proposed system. All these components work together to develop the proposed idea.

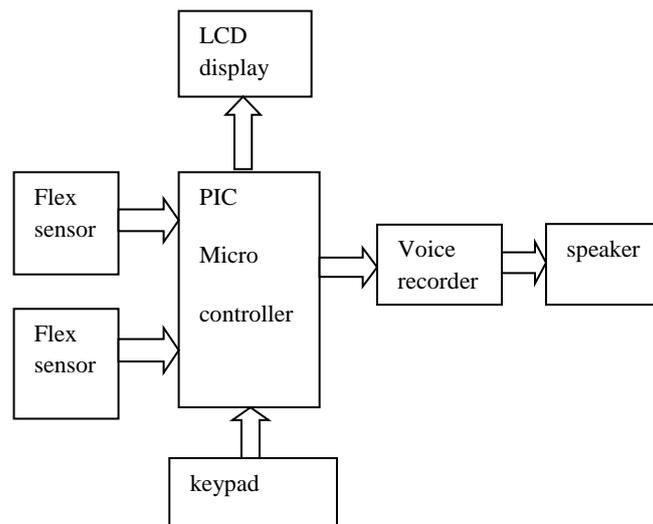


Fig 1 Proposed system block diagram

#### 4.1 flex sensors

It is a unique component that changes resistance when bent. An un-flexed sensor has a nominal resistance of 10000 ohms (10 K). Fig 2a shows the flex sensor. As the flex sensor is bent in either direction the resistance gradually decreases. This can be shown in Fig 2b. The sensor is also pressure sensitive, and may be used as a force or pressure sensor. The sensor measures 3/8 inch wide, 4 1/2 inches long and only .038 inches thick. They work as an analog voltage divider. The flex sensor operating temperature is -45F to 125F. Fig 3 shows the basic circuit for measuring the change in resistance.

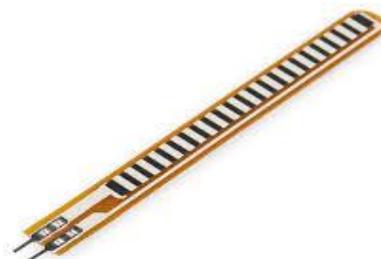
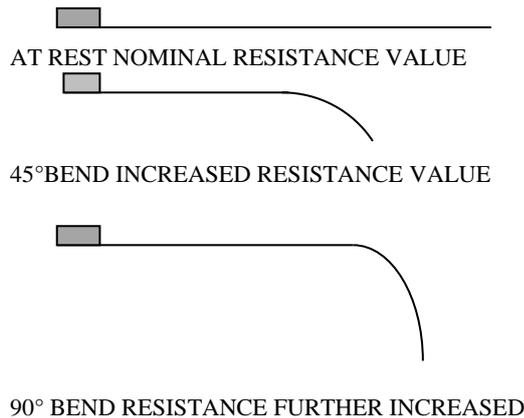
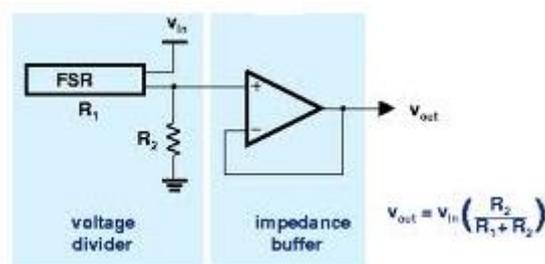


Fig 2a. Flex Sensor



**Fig 2 b.** Flex Sensor Offers Variable Resistance Readings



**Fig 3.** Basic circuit of flex sensor

## 4.2 lcd display

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. LCDs are used in a wide range of applications including computer monitors, televisions, instrument panels. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in most applications.

## 4.3 Keypad

A group of keys in a single printed circuit board is called keypad. In a keypad it has one or more than one keys are placed in a PCB and all the keys are commonly grounded. This is the main difference compared to matrix keypad. This keypad has a maximum of 8 keys. More than 8 keys cannot be connected because it is not an efficient one. There are many methods on how to connect keypad with controller, but the basic logic is the same. Here the columns are made as the input and which drives the rows making it an output. This whole procedure of reading the keyboard is called scanning. In order to detect which key is pressed from the matrix, make row lines low one by one and read the columns. Let's say, first make Row 1 low, then read the columns. If any of the keys in Row 1 is pressed will make the corresponding column low, i.e., if the second key is pressed in Row 1, then Column 2 will give low. So it is known that key 2 of Row 1 is pressed. This is how scanning is done. So to scan the keypad completely, one needs to make rows low one by one and read the columns. If any of the buttons is pressed in a row, it will take the corresponding column to a low state which means that a key is pressed in that row. If button 1 of a row is pressed then Column 1 will become low, if button 2 then Column 2 and so on.

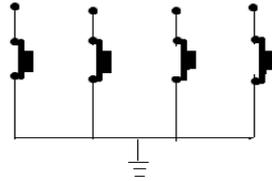


Fig 4 key pad for blind

#### 4.4 voice recorder

Recordable sound chip WTV-SR module supports MIC and LINE recording. Recording time upto 1600 seconds upto 7 kinds of operation modes: MP3 mode, one on one key mode, parallel mode, one record one play key mode, e-book mode, two wire serial mode and three-wire serial mode. It support upload and download voice via USB, playback the high quality voice downloaded from computer, it can record upto 252 segment voice (including fixed voice); With power down save data function and support key and MCU control. The Module package is DIP28. The operating voltage is 2.6-3.6 DC. The sample rate is about 10KHz or 14KHz. Its dimension is 18.30mm\*36.00.

#### 4.5 speaker

A loudspeaker is an electro acoustic transducer that produces sound when an AC current (i.e., electrical audio signal input) is applied through the voice coil that surrounds a magnet (or that is surrounded by a permanent magnet), the coil is forced back and forth due to Faraday's law, which causes the paper cone attached to the coil to respond with a back-and-forth motion that creates sound waves. Response to an electrical audio signal input.

### V. WORKING

The working principle of this idea is based on converting the incoming sign signal into voice and incoming keypad signal into displayable one. While considering the visually challenged and deaf & dumb people. The main problem faced by them is generally that the sign shown by the deaf & dumb cannot be viewed by the blind and the phrases said by the blind cannot be heard by the deaf & dumb. So we have provided a solution for this problem.



Fig 5 Glove for deaf-dumb

Here during the communication between deaf & dumb to the visually challenged, the sign shown by the deaf & dumb is sensed by using a flex sensor. These sensors are analog resistors that vary the resistance value according to the amount of bending, for this a special glove was designed with five flex sensors. Fig 5 shows the glove setup. From the glove the output based on the sign shown by the deaf-dumb is given to the processor for further processing.

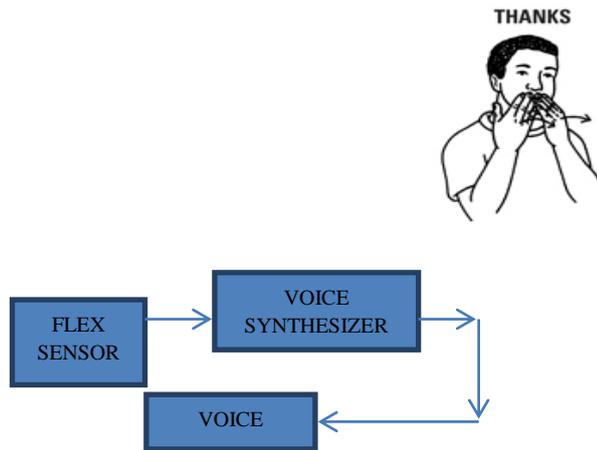


Fig 6. Example 1 (deaf-dumb to blind)

Fig 6. Shows the example 1 ,if the deaf &dumb tells “THANKS” in his sign language ,then all his fingers will be straight. At this position the resistance value will be about 100K ohm.Now this signal which is given as input to the processor .According to the input range the pre-recorded voice will be selected.This voice which is selected is then played on the speaker.This is heard by the blind people.By this way they understand the message conveyed by the deaf &dumb.



Fig 7. Example 2

Similarly for example if the word to be conveyed is “PEACE”,then two of his fingers will be bent and three will be straight.For this kind of finger position ,the resistance value will be 30-36K ohm.Then for this resistance value the corresponding phrase is chosen and the result is played on the speaker. Now consider the reverse case of communication ,whatever message the blind needs to convey is given as input through the keypad.This keypad used here is usually called the ‘brailly keypad’ which is specially made for the blind people.This input is given into the processor and then the corresponding word is displayed on the LCD display .Thus two way communication is made simple.

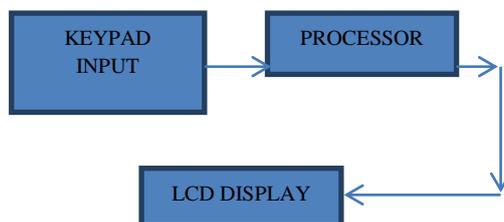


Fig 9 Blind to deaf-dumb

Fig 10 shows the practical setup for challenger’s media developed by the authors



Fig 10. Challenger's media

## VI. CONCLUSION

This paper presents the solution for the communication between deaf-dumb and blind, now the deaf-dumb can understand the message from blind by reading the LCD display and blind can understand the sign language of deaf-dumb by hearing the voice. The keypad used in this kit should be a brailey keypad which will be comfortable for the blind. The deaf-dumb should wear the glove to show the sign language.

## VII. FUTRUE WORK

The communication between deaf-dumb and blind can be extended by reducing the hardware size and making it as a glove, which is easily wearable by both deaf-dumb and blind. Using wireless communication (zigbee), the communication can be extended upto 1000 m. This means of communication is aboon for challenged people namely deaf-dumb and blind.

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