

Cell Phone for Visually Impaired people

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Abstract- Cell phones based on GSM technology for Visually Impaired People are available in market in the recent past. GSM phones has Braille keypad with large keys that helps visually impaired people to understand the digits and the presence of voice response for key press helps them to understand the numbers. Current Technology has enabled the blind to use cell phones more easily for voice calling as well as messaging. The current practice of creating information for the visually impaired in the form of Braille, generally involve manufacturing of molds, which is further used to create shaping material per Braille dots. However, the major disadvantage in producing mold is lower accuracy and are not economical. This project presents a novel design for low cost manufacturing of cell phone display using small size DC motors, which enables the blind user to read incoming text messages.

Keywords: Visually Impaired Person, Braille, GSM, DC Motor, Cell Phone.

1. INTRODUCTION

As per the statistics provided by World Health Organization, 285 million people are estimated to be visually impaired worldwide. Among these 39 million are totally blind and 246 million are suffering from low vision. For the assistance of Visually Impaired Persons in a society many technologies have been developed to provide them access to reading, writing, voice calling and also messaging. These technologies generally include conversion of information into Braille symbols and also auditory translations enabling the VIP to exchange information with others. But people suffering from deaf-blind impairment would find such systems difficult to use as audio translations cannot be heard by them. Hence our objective is to provide this community an additional alternative based on Braille which uses touch and vibration feature to sense and interpret information to themselves.

2. OVERVIEW OF CELL PHONE FOR VISUALLY IMPAIRED PEOPLE

Braille is a method that is widely used by blind and deaf-blind people to read and write. A Braille character is made up of six dots, placed in two columns of three dots each. This project proposes a design of special kind of display that has arrangement of Braille dots in the form

of matrix of small pin sized dc motors covered with rubber caps. Whenever an incoming message arrives it is converted into the Braille language i.e. dot language and then it would be given as a input to drive the dc motor matrix and accordingly particular motors would be put in motion and the rest would remain stationary. By sensing these motors, the sightless person would easily understand the message. In this project six characters can be simultaneously read in parallel. A snapshot of fabricated DC motor array is displayed

2.1 IMPLEMENTATION

The set up consists of Microcontroller ATMEG16A unit, GSM board, DC motor arrays mounted on acrylic slab and a reset circuit for controlling GSM messages. The GSM receiver is connected to the microcontroller to a port pin, which receives a message from a GSM phone. The received message is the input to a decoder latch which maintains a database of ASCII value to corresponding data that run motors. The block diagram of mobile technology for VIP

2.2 FUTURE SCOPE

The demonstration of our cell phone technology helped us identify several future research areas which include designing of micro motor strips for display devices for blind. Another area of enhancement includes enabling this project to interpret graphical data in future scope.

3. BLOCK DIAGRAM AND CIRCUIT DIAGRAM OF A SYSTEM

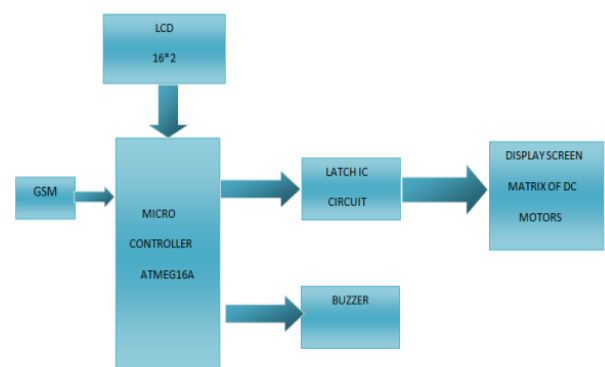


Fig -1: Block Diagram

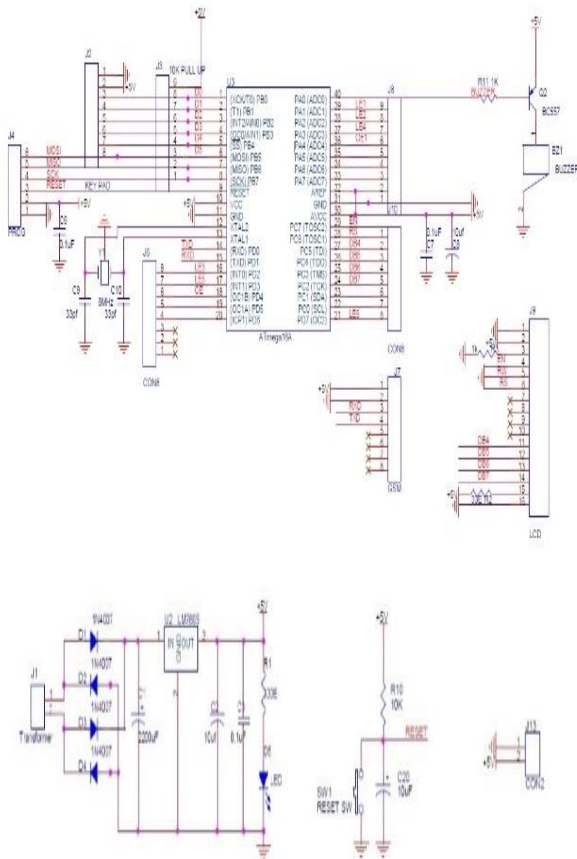


Fig -2: Circuit diagram

3.1 Working of a system

In the above block diagram we can see that that microcontroller ATMEG16A is used which is interfaced to a GSM module which is used for receive message on the 16*2 LCD display which shows the message which was received by the GSM module then the microcontroller converts the message into the braille language send shows on the motors connected to the microcontroller with latch's and the motors connected in the braille language format which can understand by the blind people the Braille dots to motors. Next task performed was making them read characters and later gradually sentences were provided for reading based on the received message from a GSM phone. The blind student was able to recognize characters easily as vibrations helped them identify the dots.

4. ACKNOWLEDGEMENTS

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5. CONCLUSIONS

These devices truly become low cost alternative to other cell phone technology, as our design results in a device with low cost, low power consuming and smaller in size.

6. REFERENCES

- <http://www.fonearena.com/blog/35760/intex-vision-phone-for-visually-impaired.html>
- Hampshire, B., "The design and production of tactile graphic material for the visually impaired", Applied Ergonomics, 10 (2). pp. 87-97.
- <http://www.who.int/mediacentre/factsheets/fs282/en/>
- Chandrika Jayant, Christine Acuario, William A. Johnson, Janet Hollier, Richard E. Ladner, "VBraille: Haptic Braille Perception using a Touch-screen and Vibration on Mobile Phones", ASSETS'10, October 25-27, 2010, Orlando, Florida, USA. ACM 978-1-60558-881-0/10/10
- <http://www.mashable.com/2013/04/24/braille-smartphone>