Interpreter System For Blind People Using Braille Pad

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Abstract: *In our life, the telecommunication field plays a important role. There is a complete revolution in the way we communicate, specifically long distance communication. Irrespective of all these advancements in the field of telecommunication, the physically impaired people have not that much amount of access as compared to normal peoples for these technologies. This system is linked with to establish a two way communication path by using a computer system and Braille pad. In this we will send the message to the computer of blind person where µc is connected to the computer which is able to read the message using the MAX232 IC through built-in command. Then it converts the character of the message by using a lookup table. The converted message is in the form of a braille language which is read by the blind person. For vibrating the braille pad we use relays and µc assembly, which gives sustainable platform and help blind person to read message.*

Key Words: MAX232IC, Braille pad, lookup table, µc

1. INTRODUCTION

Present days, blindness is one of the major diseases. 37 million people across world-wide are blind and out of them over 15 million are from India. So there is high demand in developing an assisting device for them to provide education through the low cost Braille pad. Braille was introduced in 1821 by Louis Braille, a Frenchman. The Braille system is a world-wide system used by blind and visually impaired people for reading and writing. Braille is read by passing the fingers over characters made up of an arrangement of one to eight embossed points. It has been adapted to almost every known language. Braille character consists of patterns of raised dots arranged in cells of up to eight dots in a 4x2 configuration. Braille code is available for alphabets, numeral and punctuation marks..

The developed Braille pad operates on electromagnetic principle. When voltage is applied to dots in each eight-pin array, various combinations of elevated and retracted pins produce the effect of raised dots or dot-absences. Proposed Braille pad consist of six Braille cells. Each Braille cell consists of eight movable pins in a rectangular array. The pins can rise

and fall depending on the electrical signals they receive that simulates the effect of the raised dots of Braille impressed on paper. In the electromagnetic Braille pad that contains a coil surrounds each pin. The pin is attached to an iron rod passing through the casing. When a voltage passes through the coil, the pin is popped upward, when there is no voltage applied, the pin will not be raised. The combination of raised dots represents a character. Electromagnetic coils are used for actuating the pins in the Braille cell. Braille pad and specially designed keyboard can be integrated with the normal computer monitor. Speech synthesis is the artificial production of human speech

2. LITERATURE SURVEY

Paper 1:

Author- G. Devi Priya, "Mobile Phone Hardware Based Braille Pad" IJRCCE-2015 International Conference.

Description: The user sends the SMS to the blind person's mobile number which is connected to the microcontroller which reads the SMS using GSM module through the AT commands and then converts the letters of the SMS into the Braille language using the lookup table in its memory. With the help of 6 relays Microcontroller vibrates the Braille pad on which the blind person can read the SMS. For sending a SMS, the microcontroller converts the typed Braille letter on Braille pad to the English alphabets using the Lookup table. Loud speaker is also used for making the voice announcement. From this paper, we understood working mechanism of various types of relays. This concept will help to generate embossing on paper so that blind person can interpret it.

Paper 2:

Author- Harshal A. Dahake, "Braille Pad Advance SMS System for Blind Peoples using" ICGTETM-2016

Description: Here system is linked with a GSM-GPS module to track the location of the blind person and to establish a two way communication path by using a wireless technology. Here the user sends the SMS to the blind person's mobile number

which is connected to the microcontroller which is able read the SMS using GSM module through inbuilt the AT commands and then converts the characters of the SMS into the Braille language using the lookup table present in its memory. With the help of 6 relays Microcontroller vibrates the Braille pad which act as platform from this paper, we understood that how Braille language can be use to derive a two way communication between normal people and impaired person. Also, we understood how to build the logic according to the look up table in the microcontroller.

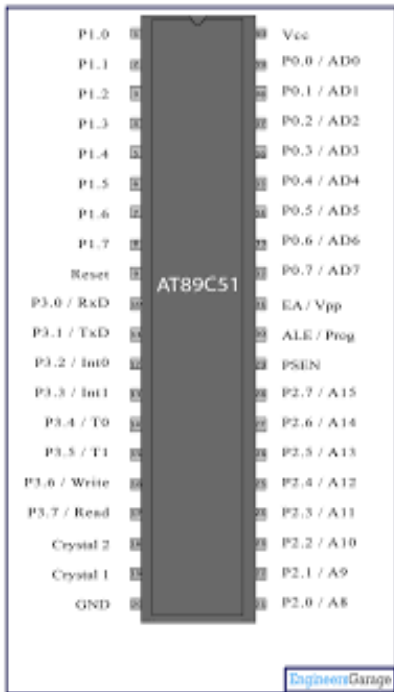### 3. COMPONENTS DESCRIPTION MICROCONTROLLER 89C51

Figure 1 Pin Diagram 89C51

AT89C51 is an 8-bit microcontroller and belongs to Atmel's 8051 family. ATMEL 89C51 has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be erased and program to a maximum of 1000 times.

In 40 pin AT89C51, there are four ports designated as P1, P2, P3 and P0. All these ports are 8-bit bi-directional ports, i.e., they can be used as both input and output ports. Except P0 which needs external pull-ups, rest of the ports have internal pull-ups. When 1s are written to these port pins, they are pulled high by the internal pull-ups and can be used as inputs. These ports are also bit addressable and so their bits can also be accessed individually.

Port P0 and P2 are also used to provide low byte and high byte addresses, respectively, when connected to an external

memory. Port 3 has multiplexed pins for special functions like serial communication, hardware interrupts, timer inputs and read/write operation from external memory. AT89C51 has an inbuilt UART for serial communication. It can be programmed to operate at different baud rates. Including two timers & hardware interrupts, it has a total of six interrupts.
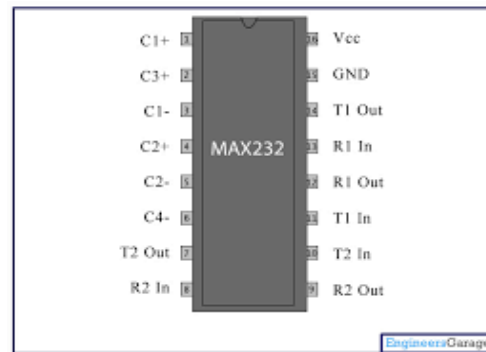
MAX232

Figure 2 Pin Diagram of MAX232

The output from the system is nothing but binary data that data is in serial form this serial data is feed to the Rx and Tx pin of MAX232.

The Function of MAX232 is converting the input voltage level into a suitable voltage level for TTL logic so that the output is use properly. The output from the Communication Protocol Unit is given to the Logical Unit.
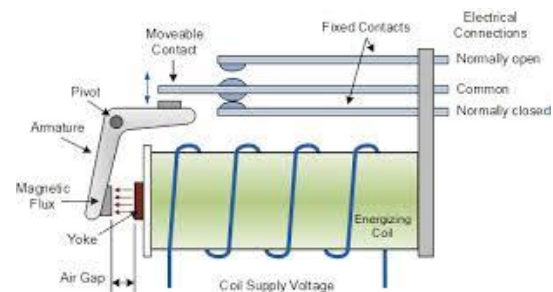
RELAY

Figure 3 Relay Mechanism

Relay unit is utilizing for the Character Embossing, Simply this is nothing but the Braille Pad which is made with the help of a 6 relay. And on the top that Relay coil we use the metal shaft which is use to emboss the character
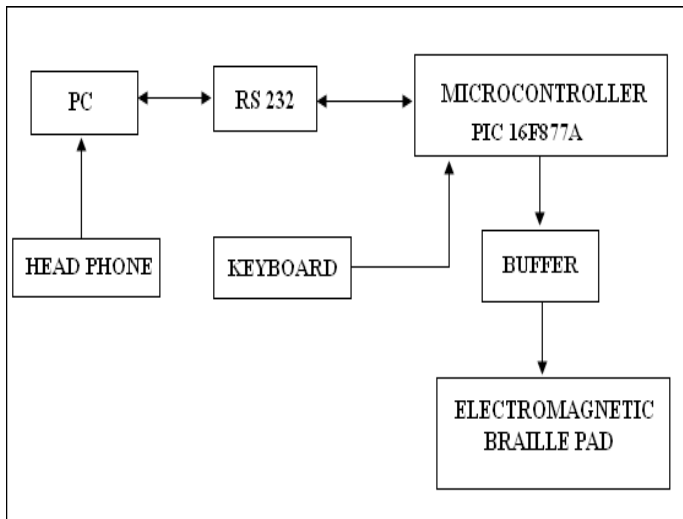
Figure 4 Block Diagram

Here, System is nothing but a computer or Laptop. In this system we build software with the help of software tools like .net or eclipse .With the help of this tools we will develop an application. This application is use to convert the speech into Braille Language, Similarly like Braille Language into Speech Form .This will perform by using the ASCII value. That ASCII value is converted into Binary form and the output will be generated by an application are feed to the Communication Protocol Unit. Communication Protocol is nothing but the set of rule for the information Interchange. The output from the system is nothing but binary data that data is in serial form this serial data is feed to the Rx and Tx pin of MAX232.

The Function of MAX232 is converting the input voltage level into a suitable voltage level for TTL logic so that the output is use properly. The output from the Communication Protocol Unit is given to the Logical Unit. Logical Unit is the main part of the system .This unit will do the logical operation via comparing the output signal with some standard value which is set in this unit. For performing the logical operation here in this system we use microcontroller (89C51 IC). According to the requirement of output some logical parameter are set, to get the desired output from the system. The output of Logical unit is further given to the Motor & relay control unit. This is nothing but the electromechanical part of the system. This unit perform their operation according to the output come from the logical unit. The motor unit is utilize for the movement of the Braille pad into X or Y position. Similarly, the Relay unit is utilizing for the Character Embossing, Simply this is nothing but the Braille Pad which is made with the help of a 6 relay. And on the top that Relay coil we use the metal shaft which is use to emboss the character.

CONCLUSIONS

Look up table for Braille code, design of circuit diagram and fabrication of Braille pad has been done. Braille pad consist of six Braille cells and each Braille cell has eight pins in a rectangular array, which is actuated by electromagnetic arrangement present underneath. According to the signal received by the pins in the Braille pad, it will pop up and the combination of raised dots   represents the character. Visual Basic code has been completed and verified by transmitting data from one PC to another PC via serial interface. By using Visual Basic as front-end tool, access to the Information is easier for the blind people. The buttons in the Visual Basic form will be present in the keyboard, which is specially designed for blind people. By pressing the keys in keyboard, the buttons in the Visual Basic form can be selected.

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