

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND:

The Morse code was created in the mid nineteenth century when individuals didn't know of developing circuits to send voice messages starting with one spot then onto the next. The message frameworks were methods for sending and getting messages with assistance of electronic motivations. The Morse code was named so after its designer, Samuel F B Morse. It keeps on being the most straightforward, effective and moderate methods for correspondence as the device needed by it was basic. This technique demonstrated that capability in English was a prerequisite to speak with the remainder of the world. Later on, this code was acknowledged all around the world and a typical International Morse code has been created and utilized

1.2 RELEVANCE:

Morse code played a crucial role in early telecommunication and still has applications in certain fields today. Exploring its history can provide insights into the development of communication technology. Morse code represents an early form of encoding information using sequences of dots and dashes. Studying Morse code within the context of information theory can help understand fundamental concepts like signal processing and encoding efficiency. Understanding Morse code can provide a foundational understanding of communication protocols and signal processing, which are essential in various modern technologies, including telecommunications, networking, and even aspects of computer science. Understanding Morse code can provide a foundational understanding of communication protocols and signal processing, which are essential in various modern technologies, including telecommunications, networking, and even aspects of computer science. Morse code can be seen as a simple form of encryption. Exploring its principles can provide insights into encryption techniques and the importance of secure communication methods in today's digital world. The proposed system detects the voluntary blinks of the patient and accordingly sends the message about the requirement to the care taker and also gives the voice output via call to the caretaker. System uses an inbuilt infra-red sensor to capture the eye movements of the patient and with the help of microcontroller in the system it generates a Morse code of patient's desire. The system identifies the Morse code and then sends a message to the care taker of what the patient wants and also the system reads the message to the care taker where in a voice is audible saying what the patient wants

1.3 PROJECT UNDERTAKEN:

The project undertaken is the development of Morse Coder Using Arduino aimed to each number and alphabet are represented by a series of dots and dashes. Create your own message in morse code using only one LED and an Arduino board. The main objective of this project is to develop a system for the paralyzed people which they can use for communicating with others. For people with these severe forms of paralysis, a lack of speech can be emotionally devastating. Alternative and augmentative devices allow people to express themselves and to have two-way conversations with caregivers, their loved ones, and others. Assistive technology can help people with varied communication limitations. People with the most severe impairments may be able to speak by using their eyes or another facial feature by directing a device. Devices may be designed only to speak or they may connect to a computer that allows a user to have computer and internet access. In this project we use people's eyes to generate Morse code by which he or she can communicate with others. An eye-tracking device, for example, may track eye movement such as blinking of eye for generating Morse code. Later this Morse code can be converted to normal text using the Arduino microcontroller. The device allows the user to talk to others using only the eyes. Other programs can work with an eye-tracking device to convert text or symbols into speech. One option has more than 11,000 pre-programmed symbols and photos that can be used to create additional symbols. People who cannot speak but have more movement may be able to use their hands to use text-to-voice software. Motor neuron disease (MND) is a medical condition where the motor neurons of the patient are paralyzed and is incurable. It also leads to weakness of muscles with respect to hand, feet or voice. Because of this, the patient cannot perform his voluntary actions and it is very difficult for patients to express his or her needs. Tetraplegia is also one such condition where people cannot move parts below their neck. In this electronic era, solutions for patients with above mentioned diseases are found, one such innovation is the proposed system explained throughout. The proposed system can be used to control and communicate with other people through eye blinks. In the recent years due to the rapid advancement in the technology there has been a great demand of human-computer or humanmobile interaction (HCI or HMI). Eye blink is a quick action of closing and opening of the eyelids. Blink detection is an important enabling component in various domains such as human-computer interaction, mobile interaction, health care, and driving safety. For example, blink has been used as an input modality for people with disabilities to interact with computers and mobile phones. The proposed system detects the voluntary blinks of the patient and accordingly sends the message about the requirement to the care taker and also gives the voice output via call to the caretaker. System uses an inbuilt infra-red sensor to capture the eye movements of the patient and with the help of microcontroller in the system it generates a Morse code of patient's desire. The system identifies the Morse code and then sends a message to the care taker of what the patient wants and also the system reads the message to the care taker where in a voice is audible saying what the patient wants

1.4 ORGANIZATION OF PROJECT REPORT:

The report is divided into six parts. Each part has various chapters explaining in detail.

CHAPTER 1: Discusses the introduction of entire project as well as organization of report.

CHAPTER 2: Discusses literature survey done on the selected topic in detail.

CHAPTER 3: Describes block diagram and it working along with selection component for the project.

CHAPTER 4: Discusses implementation of circuit diagram generation of PCB Layout.

CHAPTER 5: Includes discussion about simulation results and final results of project.

CHAPTER 6: Discusses conclusion of the entire project.

1.5 SUMMARY:

Using Morse code for communication is not an easy task, but with this system it becomes lot easier as only one person needs to know Morse code. The rest of the transcription process is done by a microcontroller. Detecting eye blink is a challenging process. This is due to the movements of eye ball and artificial lighting which may confuse the system. Here we resolve this problem by adjusting the distance between the eyes and the sensor.

CHAPTER 2

LITERATURE SURVEY

2.1 Interfaces from Literature Survey:

Morse code is an arrangement of correspondence to encode any character in two unique terms of signs called Dots and Dashes. Morse code is created by Samuel F.B. also, further utilized in telecommunication for moving restricted intel. It was generally utilized at the hour of World War II. A Morse code can be performed by tapping, blazing light or composing. The Morse code is accessible in two forms, the first and the global morse code. In the worldwide morse code, the first form is adjusted by eliminating spaces and planning the runs in a particular length. The Morse code is accessible for encoding letters in order and numbers. It is fundamentally utilized in the radio and sea correspondence and furthermore a piece of preparing for warriors. The language has consistently been the boundary for the Morse code, as it's difficult to play out the code for diacritic characters in other language. There are some celebrated words considered as significant component of Morse code like 'SOS'. SOS full structure is Save Our Souls made as an all inclusive trouble signal addresses peril. getting messages with assistance of electronic motivations. The Morse code was named so after its designer, Samuel F B Morse. It keeps on being the most straightforward, effective and moderate methods for correspondence as the device needed by it was basic. This technique demonstrated that capability in English was a prerequisite to speak with the remainder of the world. Later on, this code was acknowledged all around the world and a typical International Morse code has been created and utilized. Through technology many ways of communication are possible. Communication is differing from one case to another case. Normal people will communicate through speaking and hearing in an understandable language. Differently abled people like deaf and dumb will have an alternate way of communication like through sign language but the problem with sign language is, it is not comfortable for all the people. To have an effective communication between differently abled people and normal people there is a need for a sign language translator. And this translator is not only useful for good understanding but also for Secret information passing which is very useful in national security. Morse code is a type of sign language which is built upon dots and dashes symbols. There are several surveys on the morse code. The surveys explain the possibilities and drawbacks of the implementations . As far as the future of this system is concerned, an alarm can be set when the caretaker misses to attend the call or miss to view the message. This alarm will alert the caretaker and he can respond to it immediately.

T4_2 – Morse Coder using Arduino.

Another improvisation can be of setting the IOT devices. An IOT device can be set in a way such that the patient is able to operate light switch and regulate the fan with the help of blinks which will reduce the work of caretaker and also patient feels independent. Also, we can use a camera instead of IR sensor by which the patient can add more instructions with eye movements. For example, the patient can scroll through a mobile phone or computer using eye movements

2.3) Summary

Using Morse code for communication is not an easy task, but with this system it becomes lot easier as only one person needs to know Morse code. The rest of the transcription process is done by a microcontroller. Detecting eye blink is a challenging process. This is due to the movements of eye ball and artificial lighting which may confuse the system. Here we resolve this problem by adjusting the distance between the eyes and the sensor.

CHAPTER 3

BLOCK DIAGRAM AND ITS WORKING

Description of Block Diagram

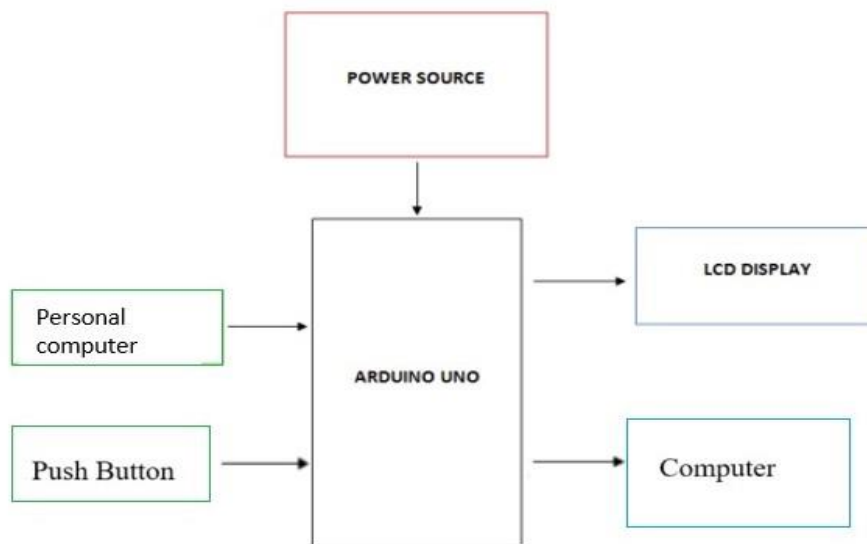


Fig 3.1 Block Diagram of Morse Coder

Setup the hardware by hooking up everything as shown in the schematic diagram. Connect the buzzer between GND and pin 8 of the Arduino and the Morse key (I use a [tactile switch](#)) between GND and pin 7. Besides the GND and +5V pins the LCD has an SCL and SDA connection that you connect to the pins with the same names on the Arduino. I didn't use pull-up's to connect the LCD, but you could if you want to.

1) Arduino Uno



Fig 3.2 Arduino Uno

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output, 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip

2) Jumper Wire



Fig 3.3 Jumper Wire

A jumper wire is an electric wire that connects remote electric circuits used for printed circuit boards. By attaching a jumper wire on the circuit, it can be short-circuited and short-cut (jump) to the electric circuit.

3) LCD

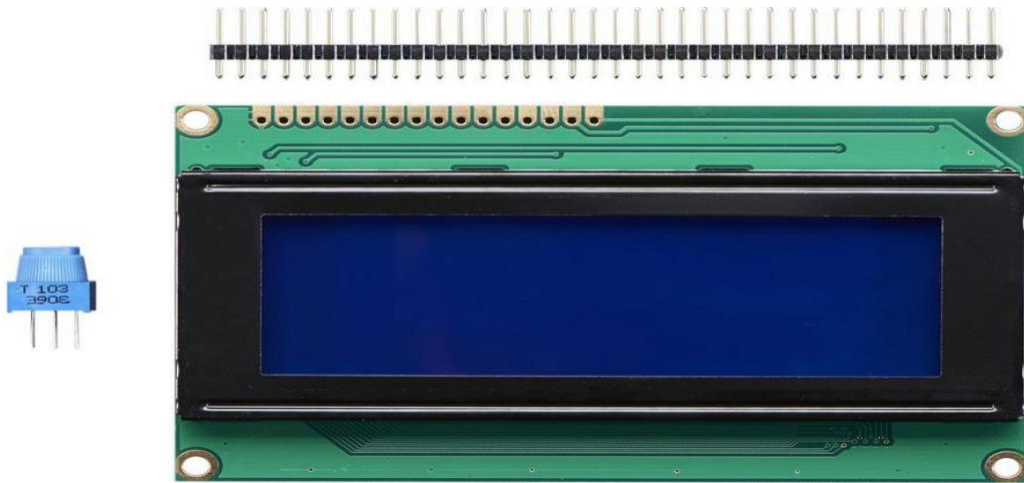


Fig 3.4 LCD

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LCDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels

4) I2C Module

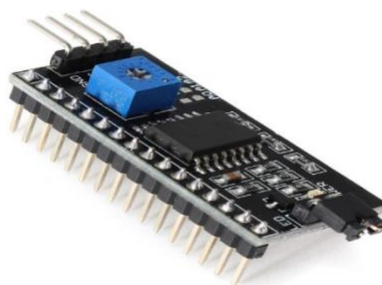


Fig 3.5 I2C Module

The KY-020 Tilt Switch Sensor module is a switch that reacts to movement. It closes the circuit when it's tilted to the side as long as it is moved with enough force and degree of inclination to activate the ball switch inside.

5) Buzzer



Fig 3.6 Buzzer

Buzzers are small devices that convert electricity into a sound signal. They are able to generate a sound in the range of human audibility, which is a specific sound information. The sound of the buzzer is so piercing that it can be heard even in a very noisy place. Buzzers are usually used as sound signaling device

6) Switch



Fig 3.7 Switch

A Basic Switch has a micro contact gap and snap-action mechanism*, and turns ON and OFF with a specified movement and force. This is a mechanism that enables instant switching at a fixed operating position, regardless of the operating speed and operating force of the switch.

CHAPTER 4

CIRCUIT DIAGRAM

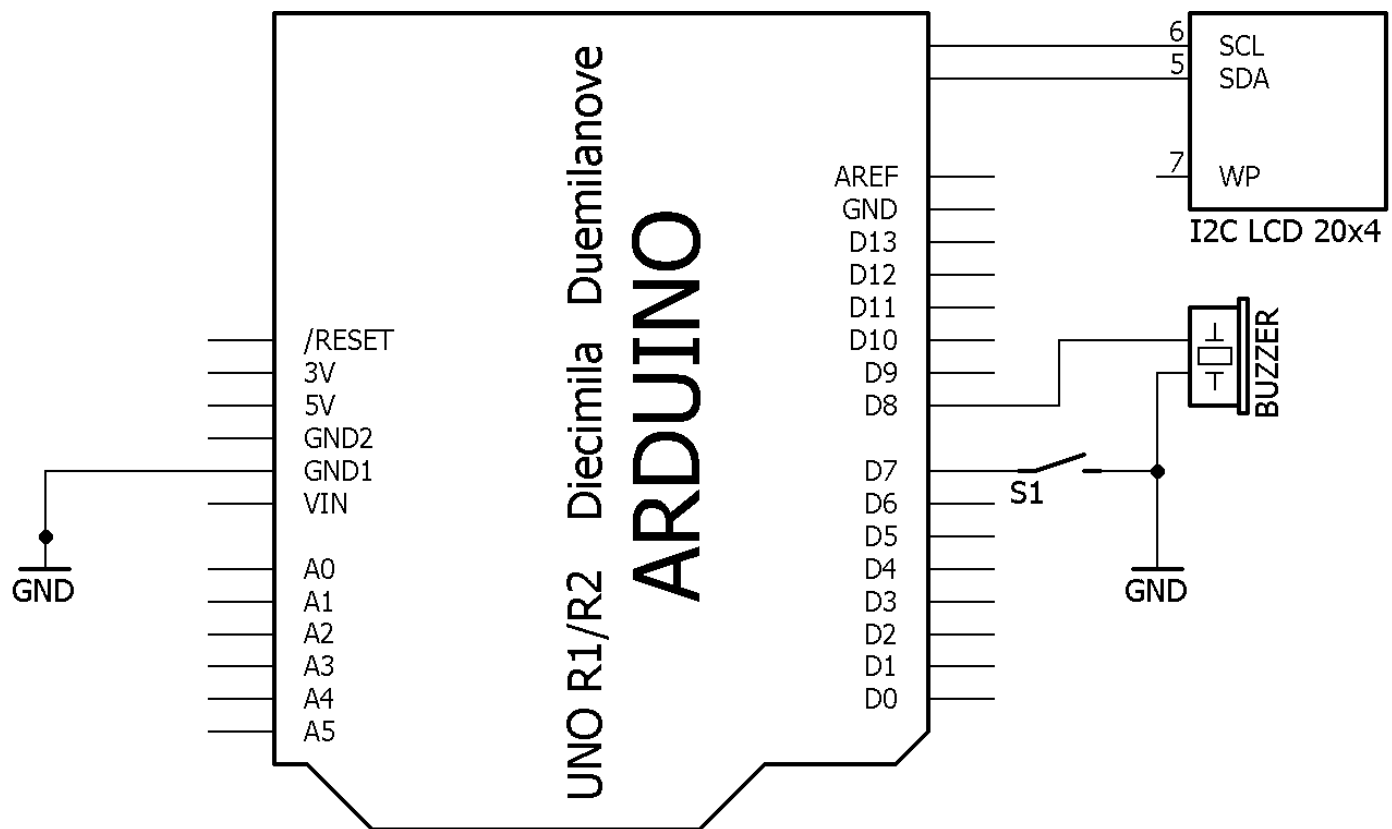


Fig 4.1 Circuit Diagram

PCB LAYOUT

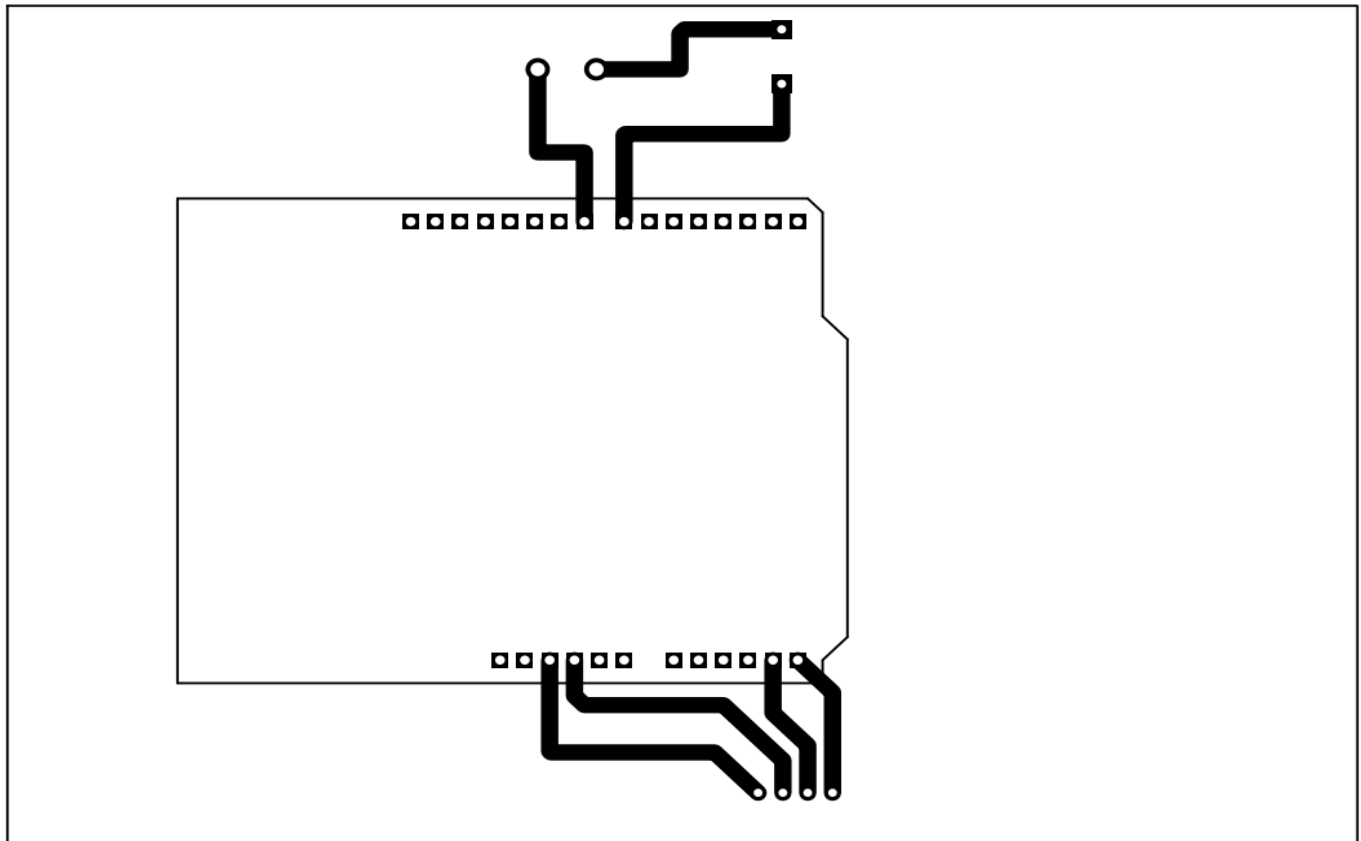


Fig 4.2 PCB Layout

CHAPTER 5

SIMULATION RESULT

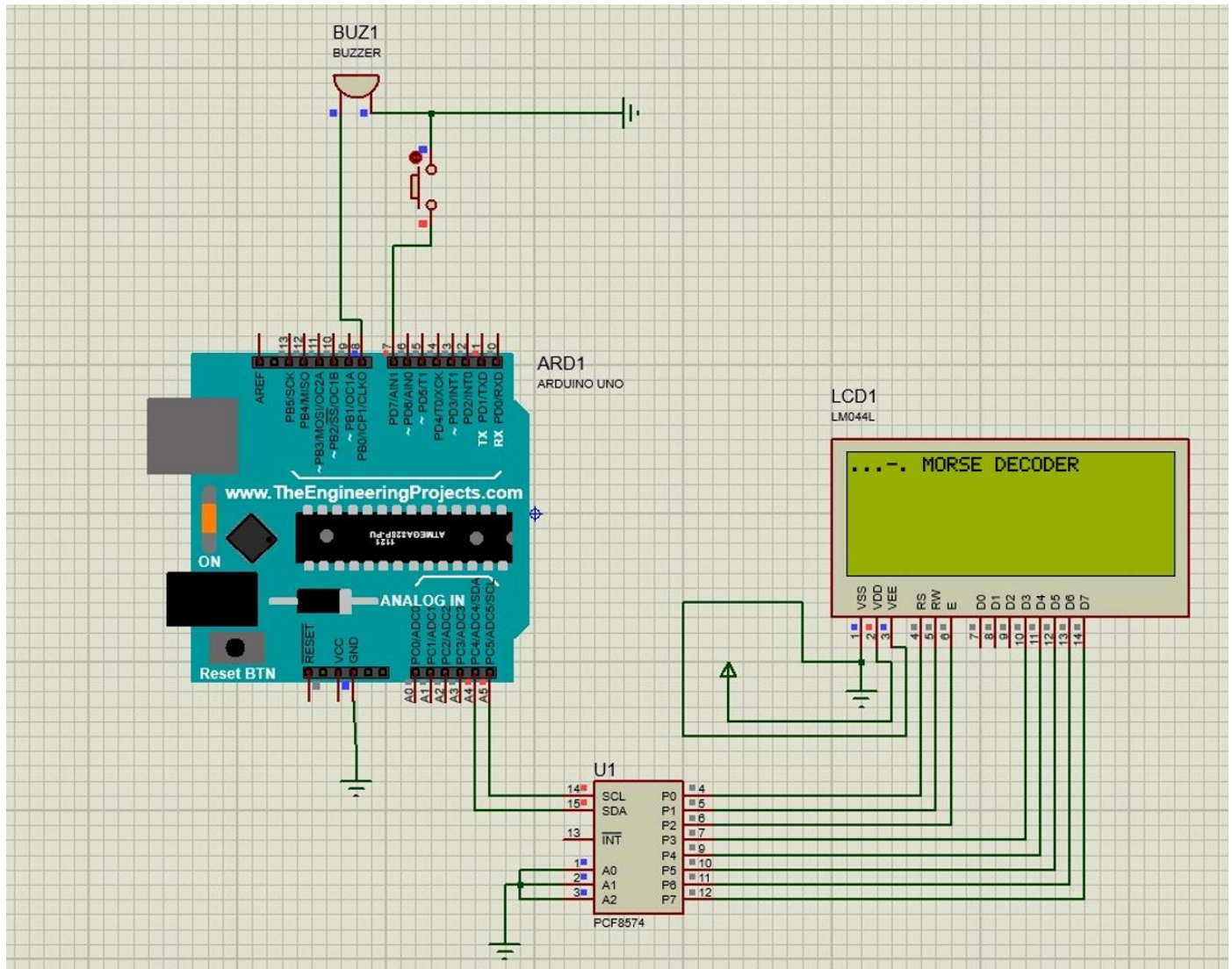


Fig 4.3 SIMULATION RESULT

FINAL RESULT

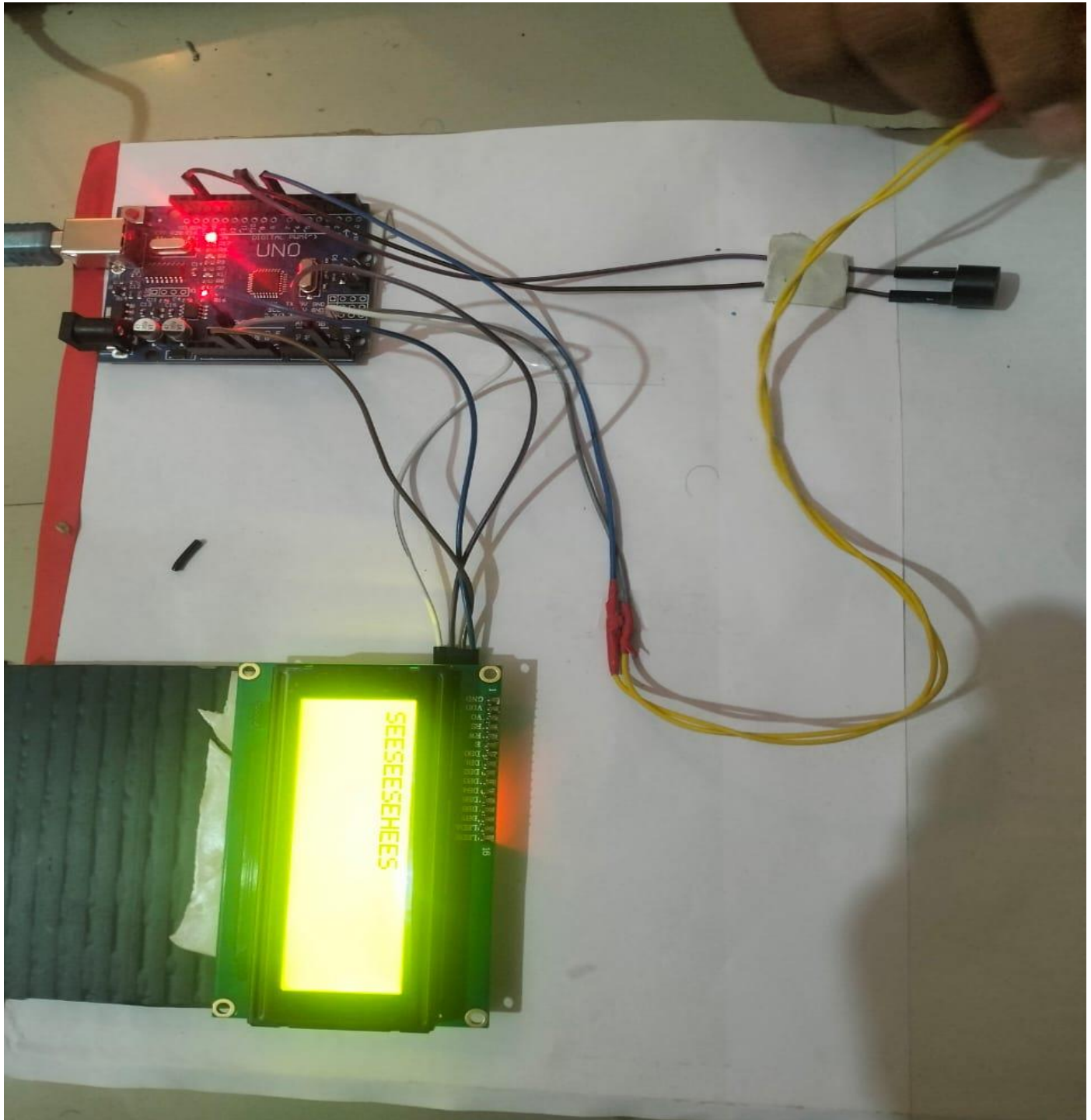


Fig 4.4 FINAL RESULT

CHAPTER 6

CONCLUSION

The system is anticipated to decode Morse code signals with precision, leveraging a sensor input and real-time processing. The user interface provides a seamless interaction and enables the translation of Morse code into alphanumeric characters. The compact and portable design makes this Arduino-based Morse code decoder a versatile tool for learning and practical communication.

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