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Automatic Paralysis Patient Support System

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Abstract: This system works by reading the tilt direction of the user's hand. The user just has to tilt his hand in forward, backward, left and right directions to convey his message. The respective messages would be standard like, food, water, medicine and Emergency. This project will make the message conveying of a paralysis patient easy. Now the patient would not have to wait for someone to come and address him and the time wasted to convey the message. The objective is to save time and make life easy for a paralysis patient.

I. INTRODUCTION

In Today's world many people are suffering from paralysis and most of the paralytic patient dependent on care takers. Paralysis is a condition in which there is impairment of one or more muscles in the body. The prime motive of the proposed system is to provide solution for these inabilities. Whenever the patient tilt his/her hand to express his/her requirements it will be interpreted into auditory speech through which the caretaker can understand the patient's needs. The system will send LCD message to the caretaker.

This device needs to be mounted on user hand. The user now just needs to tilt the device in a particular direction to convey a message. Tilting the device in different directions conveys a different message. It then passes on this data to the microcontroller. The system makes use of a microcontroller based circuitry to achieve this functionality. Even though, there are innovative approaches for curing or treating paralysis patients, but the aim of treatment is to help a person adapt to life with paralysis by making them as independent as possible. Even though, there are innovative approaches for curing or treating paralysis patients, but the aim of treatment is to help a person adapt to life with paralysis by making them as independent as possible. Where we see a problem with these types of devices that are being developed is that they are very large and expensive machines. They seem to be only available in hospitals and not able to be used at the patient's home or at their convenience. Our goal is to make a device that will be able to retrain a patient's motion but have them be able to use the device themselves.

II. BLOCK DIAGRAM

There are two block diagram involved in it. One is block which are forming on patient's hand as Transmitter and other one forms the care taker's arm as Receiver.

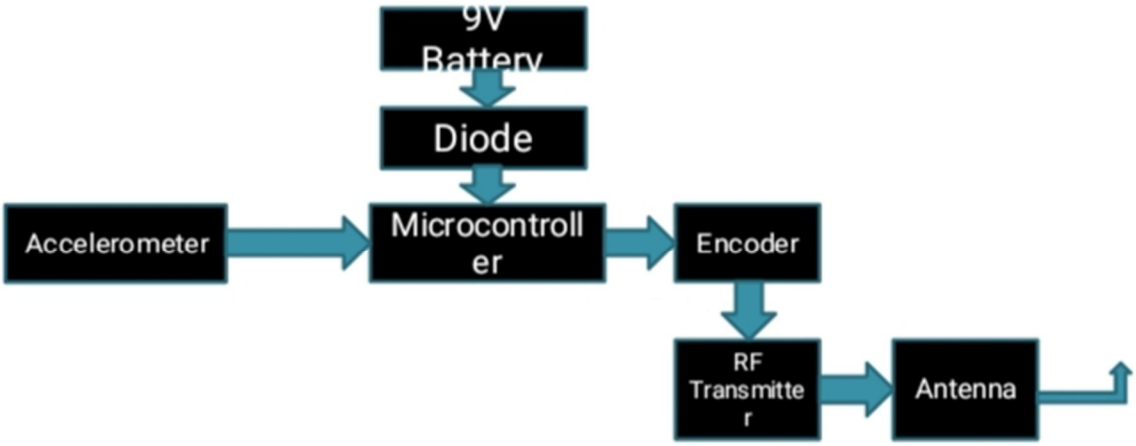

Fig.1. Block Diagram of Transmitter

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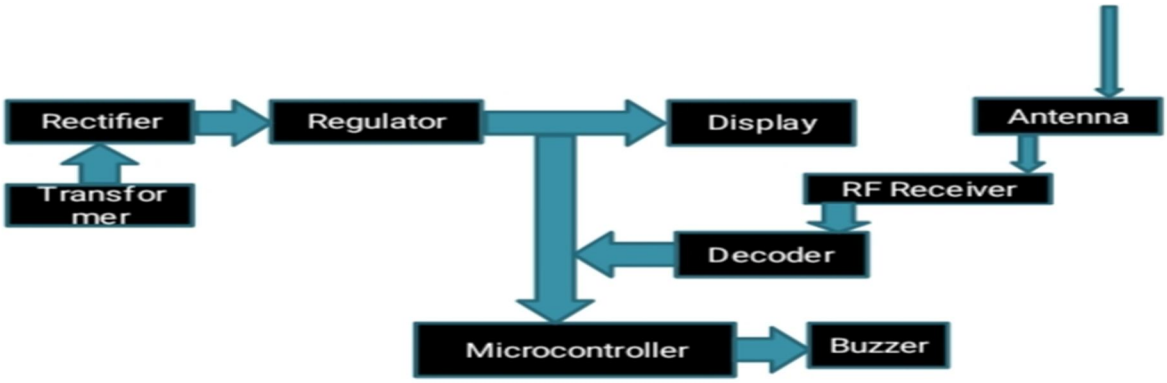

Fig.2. Block Diagram of Receiver

III. BLOCK DIAGRAM DESCRIPTION

A. Accelerometer

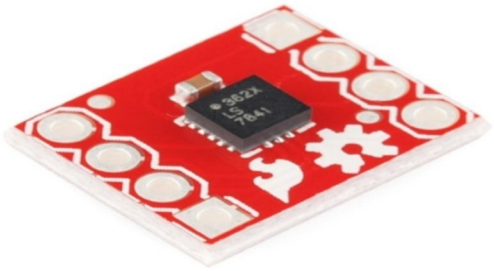

Fig.3. Accelerometer

Features

1) Ultralow power
2) High resolution: 1mg/LSB
3) Built-in features for system-level power savings
4) Acceleration sample synchronization via external trigger
5) On-chip temperature sensor

B. RF Transmitter(HT12E)

1) HT12E is an encoder integrated circuit of series of encoders.
2) Simply put, HT12E converts the parallel inputs into serial output.
3) The RF module operates at Radio Frequency that varies between 30 kHz
4) The microcontroller provides the data to the RF module which is to be transmitted.

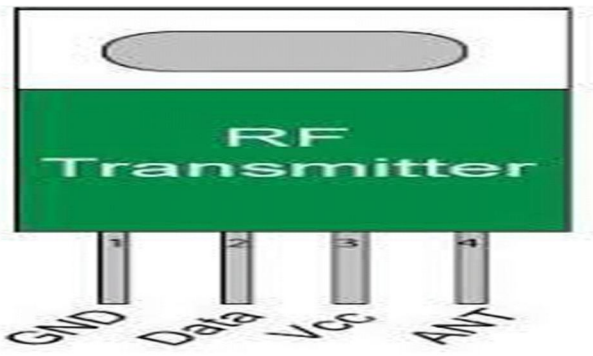

Fig.4. RF Transmitter

Features of RF Module

1) Receiver frequency 433MHz
2) Receiver typical frequency 105Dbm
3) Receiver supply current 3.5Ma
4) Low power consumption
5) Receiver operating voltage 5v
6) Transmitter frequency range 433.92MHz
7) Transmitter supply voltage 3v~6v
8) Transmitter output power 4v~12v

C. RF Receiver(HT12D)

1) HT12D is a decoder integrated circuit that belongs to series of decoders. They are paired with series of encoders.
2) RF receiver module takes the modulated RF signal and then demodulates it.
3) RF receiver modules are usually of two types, namely the super-regenerative receivers and super-heterodyne receivers. Normally, the super-regenerative modules are of low cost and also have low power designs. These modules use a series of amplifiers to remove modulated data from a carrier wave.

Fig.5. RF Receiver

D. Microcontroller AT89C51

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It has four ports which are used as input or output according to your need. he AT89C51 program memory is programmed byte-by-byte.

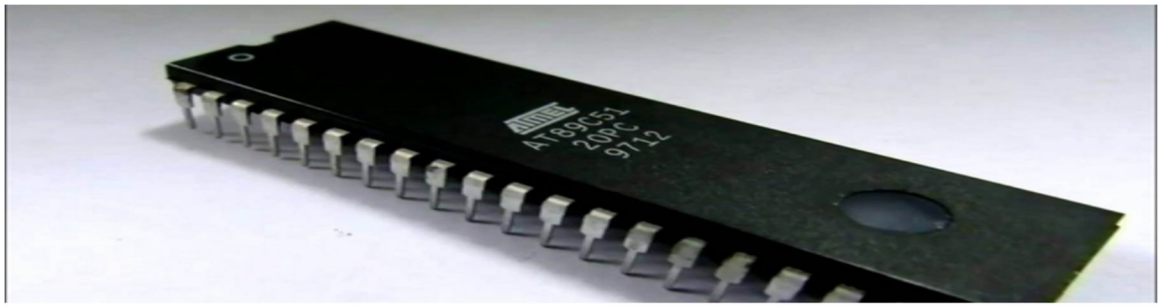

Fig.6. Microcontroller AT89C51

Features

1) Three-level Program Memory Lock 5. 128 x 8bit Internal RAM 6. 32 Programmable I/O Lines
2) Two 16-bit Timer/Counters
3) Six Interrupt Sources
4) Programmable Serial Channel
5) Low-power Idle and Power-down Modes

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E. LCD (Liquid Crystal Display)

It is a combination of two states of matter, the solid and the liquid. CD technology is used for displaying the image in a notebook or some other electronic devices like mini computers. This image is then displayed on the screen. The reasons being: LCDs are economical; easily programmable.

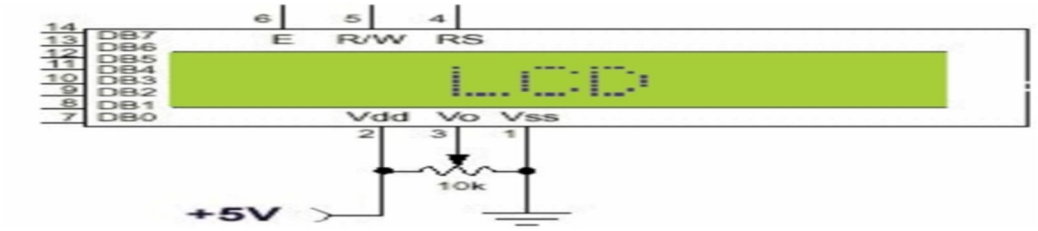

Figure.7. LCD

Features
5x8 dots with cursor
Built-in controller(KS066 or Equivalent)
+5V power supply(Also available for +3V)

F. Diode

This is a junction Diode. If the positive terminal of the battery is connected to the p-type material (cathode) and the negative terminal to the N-type material (Anode) a large current will flow. This is called forward current or forward biased. Power diodes are used in converting AC into DC. In this, current will flow freely during the first half cycle (forward biased) and practically not at a during the other half cycle(reversed biased). This makes the diode an effective rectifier, which convert for detection.

G. Voltage Regulator

One of the important sources of DC Supply are Batteries. But using batteries in sensitive electronic circuits is not a good idea as batteries eventually drain out and loose their potential over time. Also, the voltage provided by batteries are typically 1.2V, 3.7V, 9V and 12V. But, most of the TTL IC's work on 5V logic and hence we need a mechanism to provide a consistent 5V Supply.

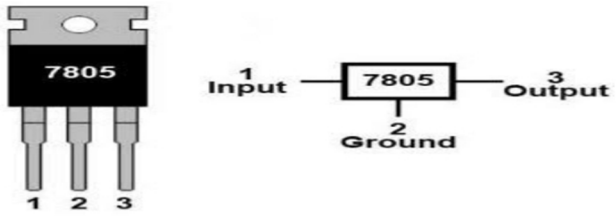

Fig.8. Voltage Regulator

IV. SOFTWARE DESCRIPTION

A. Keil Micro Vision IDE

Keil MDK environment for a wide range of Arm Cortex-M based microcontroller devices. MDK includes the micro vision IDE and debugger, C compiler, and essential components. Keil Micro Vision is a free software which solves many of the points for an embedded program developer. embedded software development.

Embedded C: Embedded C Programming plays a major role in performing specific functions by the processor. Each processor is associated with embedded software. In our day-to-day life, we frequently use many electronic devices such as washing machines, mobile phones, digital camera and so on will work based on microcontrollers that are programmed by embedded C. The first and foremost tool is the embedded software that decides the operation of an embedded system. One of the great things about the C language is that it allows you to perform low-level manipulations of the hardware if need be, yet provides the functionality and abstraction of a higher order language. In 2008, the C Standards Committee extended the C language to address such capabilities by providing a common standard for all implementations to adhere to.

V. ADVANTAGES

A. Easy conveying of messages for a paralysis patient
B. User friendly
C. Improve productivity
D. Easy to operate
E. Supports human welfare

VI. FUTURE ASPECT

In future GSM module can be added to the system for conveying messages on the mobile. If the in charge person is outside the home, then he may not read the LCD display. For this, GSM module can be implemented. Further, more researches will show about problems related to paralysis patient, On the basis of surveys more advanced features can be added to this project in future for easier lifestyle of paralysis patients.

VII. CONCLUSION

A structured process is followed and implemented considering the norms and guidelines that have been demonstrated in this article. The working model of the proposed project is obtained. The article has emphasized that consideration for the physical and mental limitations of human is an essential aspect in the design of interfaces and the project.

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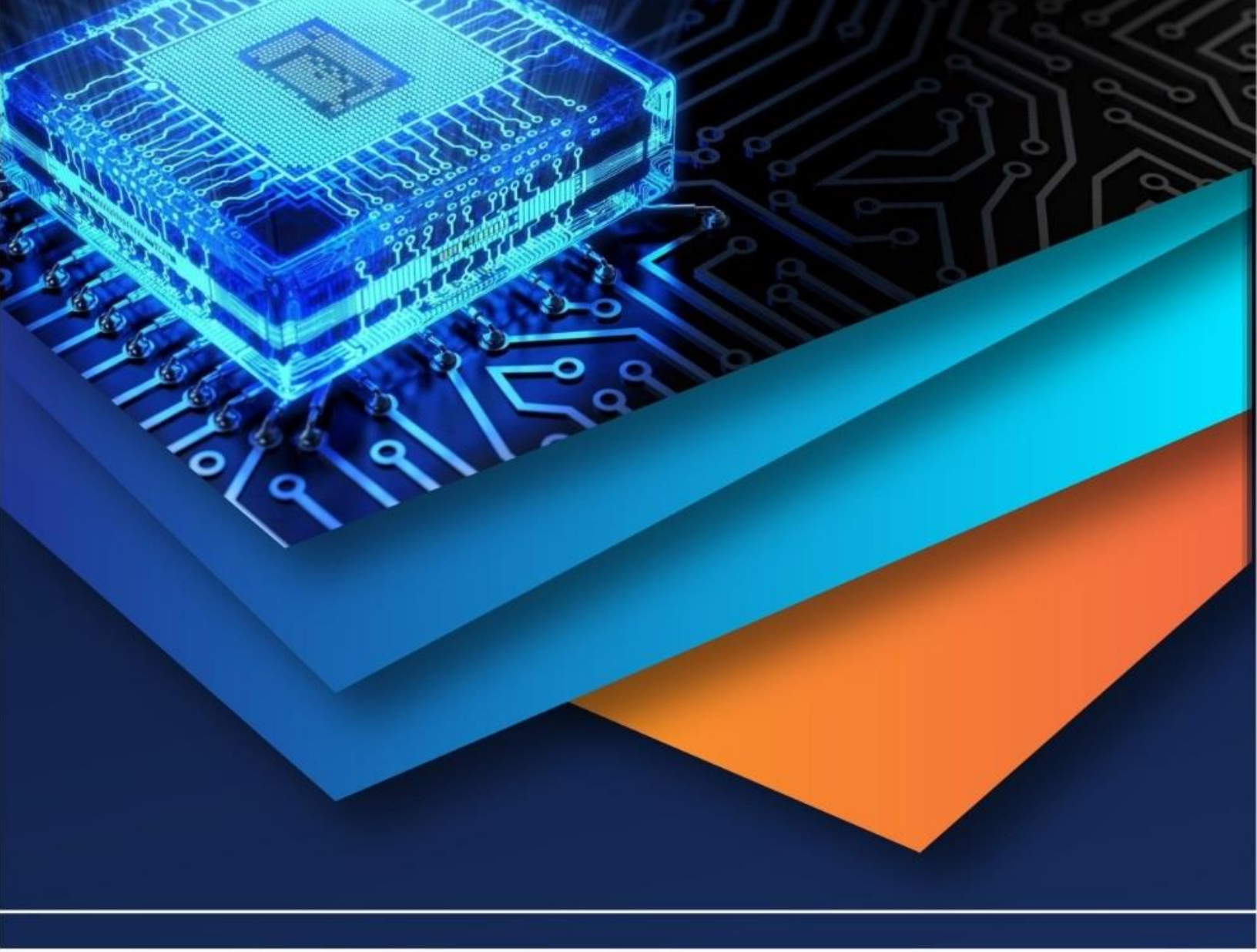

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