

# A Novel Approach for a Portable Wireless Calling Bell for Deaf and Dumb

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**Abstract**—Calling Bell or Doorbell are meant for calling the people and let the people know that somebody is knocking at the door or calling a person, but what In case of a deaf and dumb? They can't listen to what we are saying. So here is a simple, portable low cost solution explaining the working and circuit of a wireless calling bell for deaf and dumb which will help a deaf to know that somebody is knocking at the door. In order to let them know we can't use some sound producing gadgets like calling bells. Therefore we have used some vibrators attached to their body in the form of wrist band (say) which will help them know the presence of someone at the door. So in addition to the normal calling bell we will have an extra wireless unit attached to the hand of the deaf peoples. So when the calling bell switch is pressed in addition to the calling bell sound the wireless unit will also create a vibration at the hand of the people. Hence he can feel the presence of the person at the door

**Keywords**—ASK Modulation, RF Transmitter (434 MHz), RF Receiver (434 MHz)

## I. INTRODUCTION

According to the statistics of obtained from World Health Organization, about 300 million are deaf and about, 1 million are dumb and many more suffering from other physical disabilities. Within a short span of time Human Life and their comfortableness have reached to a great height with the developments in Science and Technology. During the last few decades various advanced technologies have emerged which have made our life much easier and comfortable that we don't even move our body to do any task. But we always give emphasis to the common man and we have always forgotten the section of our population those are uncommon those peoples we call as Physically Disabled people who are always deprived of the advancements of such Science and Technologies. This is so because Science has not given that much comfort that is required by them to make them feel that they are too a part of this advanced society and they too have the rights to walk on a par with the best. Communication being the essential aspect of human life is very much difficult for the people who are Deaf or Dumb.

This paper is going to concentrate on the fact and tries to develop a new wireless calling bell system which is specially designed for a Deaf which can help him to communicate easily with the outside world with other normal persons or the persons of their own kind.

The main objective of this paper is to bridge a gap in communication and to develop some simple technology which will help a deaf to feel the presence of someone at the door.

Here we have put forward a prototype which will help a deaf to recognize the presence of person at the door.

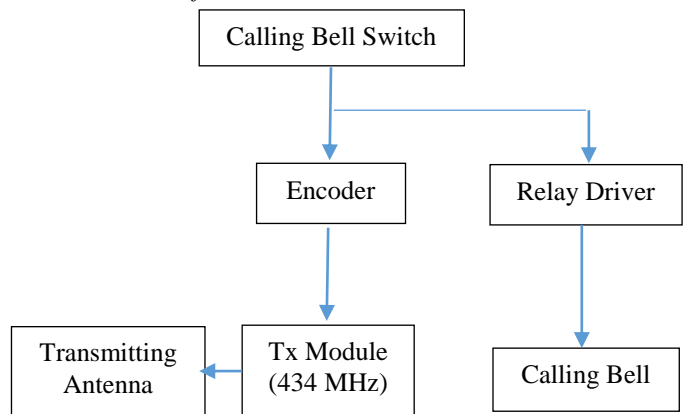
The prototype is based on the concept of Wearable Technology i.e. the person has to wear the gadget on their wrist as a wrist band and when any person presses the calling bell then he/she can feel the vibration on their hand as well they can get a visual indication in the form of light.

## II. PROPOSED DESIGN

### A. Description

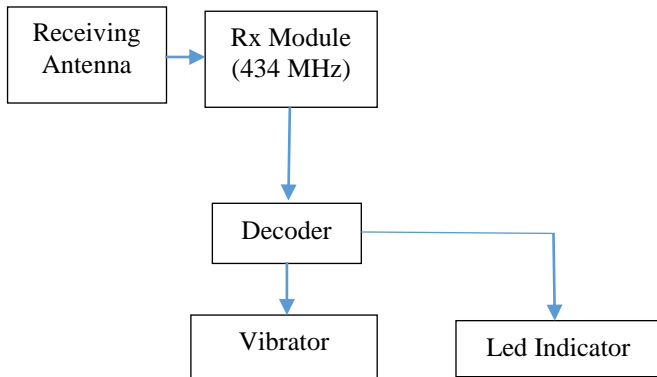
In this paper we have designed a calling bell for deaf and dumb. Generally we have the normal calling bell but we never thought of how to call a physically handicapped (a deaf person). Here we have made a wireless calling bell which is very useful for a deaf person. When somebody presses the calling bell switch, the calling bell then sends the signal to the receiver unit which in turn activates the vibrator so a deaf can feel the vibration and know that somebody is calling/knocking at the door. It uses RF (Radio frequency) technology (434 MHz).

### B. Flow Chart of Transmitter Section



When someone presses the calling bell at the door, the signal from the calling bell is sent to the encoder IC which is then fed to the Transmitter Module for the wireless transmission through Transmitting antenna at the same time the signal is also sent to the relay driver which operates the Calling Bell.

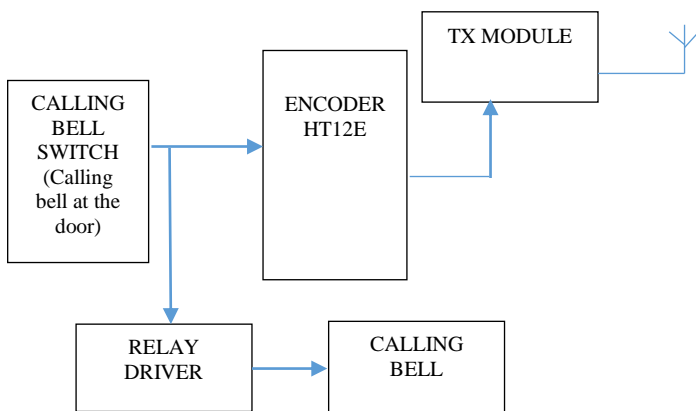
C. Flow Chart of Receiver Section



The Receiving antenna receives the signal from the Transmitting antenna which is received by the receiver module then the signal is fed to the Decoder for decoding so that it can effectively operate the Vibrator attached in the wrist band unit.

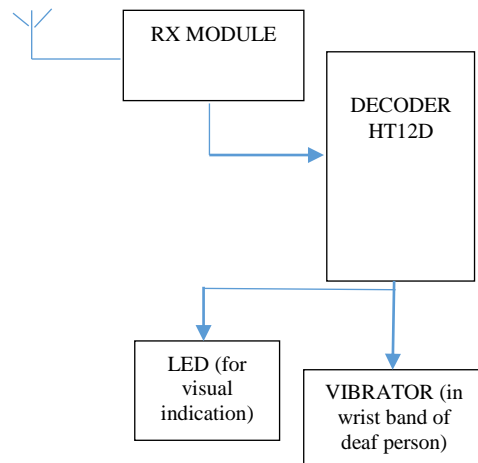
III. BLOCK DIAGRAM

A. Transmitter Section



The Calling Bell switch is connected to a 5V DC supply when the person presses the switch then the 5V is given to the data pins of the HT12E. HT12E is the Encoder IC capable of encoding information which consists of N address bits and 12-N data bits. Each address or data input can be set to either 1 or 0. The programmed addresses or data are transmitted together with the header bits via an infrared transmission medium or RF upon receipt of a trigger signal. The transmitter module then performs the ASK Modulation hence this signal is transmitted through the air by the help of a transmitting antenna which is received by the receiver antenna on the other side.

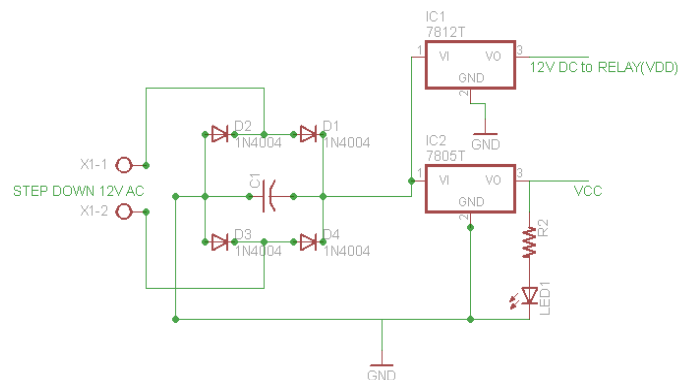
B. Receiver Section



After the data being received by the receiving antenna the data is then given to the decoder IC HT12D through the Receiver Module. HT12D is the decoder IC capable of decoding information that consist of N bits of address and 12-N bits of data. For proper mode of operation, a pair of encoder or decoder with the same number of addresses and data format should be chosen. Then the decoded data is fed to the Vibrator for vibration and the same data is also fed to the led for visualization. Hence the deaf person can sense the vibration as well as he can also visualize the effect by the LED.

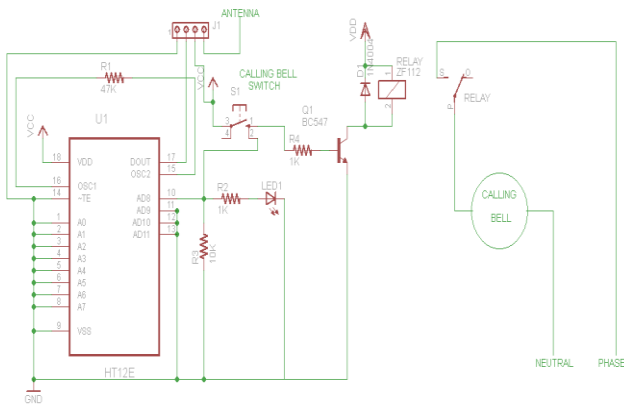
IV. CIRCUIT DIAGRAM

A. Circuit Diagram with Explanation



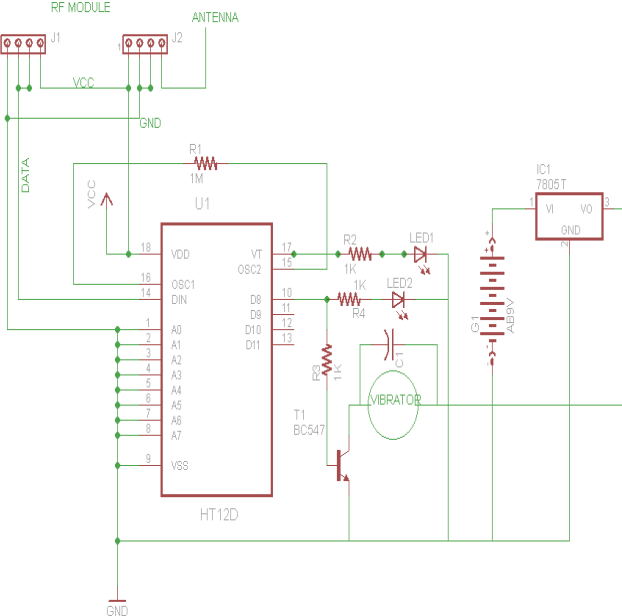
The above figure is the power supply section. The Step down 12V AC is fed to the bridge rectifier. The rectifier converts AC to DC and it gives the DC voltage to the 2-Voltage Regulators (7812 and 7805). IC1-7812 is used to provide the power supply to the relay (here 12V SPDT relay is used). IC2-7805 is used to provide the power supply to the rest of the components. LED1 is used for the indication purpose that the system is powered ON.

B. Transmitter Section Circuit Diagram with Explanation



The switch S1 is the calling bell switch which is connected to the 5v DC supply. When anyone presses the switch, the 5v DC is fed to the 10<sup>th</sup> pin i.e. AD8 of HT12E all other pins (AD9-AD11) are grounded as they are of no need. When 5V is fed LED1 glows and at the same time it also triggers the relay so the calling bell also beeps. The data being fed to the encoder encodes the data and the encoded data is given out through the 17th pin i.e. DOUT pin of HT12E. The encoded data is given to the Transmitter Module (434 MHz) which modulates (ASK Modulation) the data and send the same through the transmitting antenna.

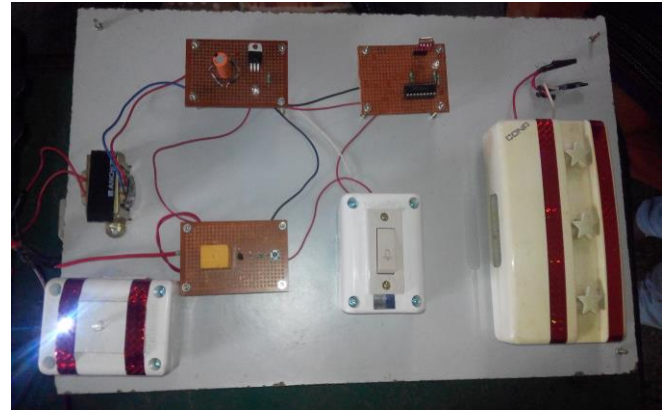
C. Receiver Section Circuit Diagram with Explanation



The receiving antenna receives the modulated signal then it fed the signal to the RX Module which is then fed to the HT12D for decoding the signal back to 4bit. As there is no address to be received so all the pins (A0-A7) are grounded. The encoded data is reflected in the D0 pin which triggers the BC547 as a result the vibrator vibrates. A capacitor is connected across the vibrator because when the calling bell is pressed it will keep on vibrating for some time to help the deaf

respond effectively. Here 7805 IC is used for the vibrator in order to provide the constant 5v DC to the vibrator. We can also use a rechargeable battery.

V. EXPERIMENTAL SETUP



We have tested the prototype and also tested it with a deaf person. In future we shall expand the prototype for the 2 way communication.

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